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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLIV. No. 3022.] LONDON, APRIL 13, 1921. [73RD YEAR. PRICE 1s.

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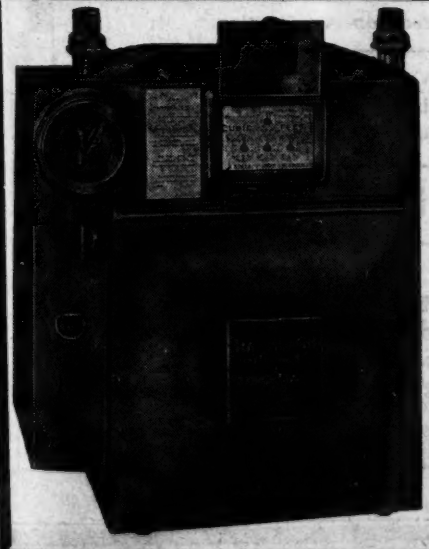

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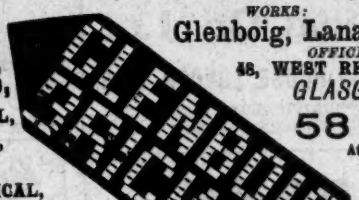

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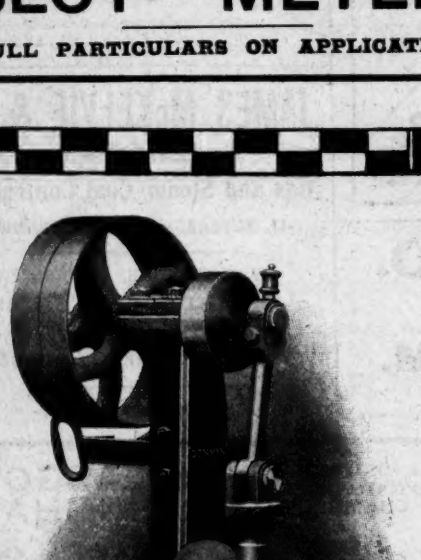

FIG. 536.

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CLIV., No. 3022.] WEDNESDAY, APRIL 13, 1921. [73RD YEAR.

EDITORIAL NOTES.

The Intervention of Reason.

ABORTIVE conferences, communications between the Prime Minister and the Miners' Federation and the coal owners, argument, and discussion, all with the view to secure the reopening of negotiations between the contending parties in the coal dispute and strike, caused the days of last week to pass for the country under any but happy conditions. The meetings of the railway men and the transport workers, sometimes with the miners, brought before the country the black prospect of having a railway and general transport strike to intensify worries and difficulties, with the object of endeavouring, by the creation of indescribable chaos, to compel the Government to bow to the will of the Miners' Federation. The time has never been, and cannot be now, when the Miners' Federation can be allowed, in respect of the mining industry, to impose conditions upon the country which it cannot carry, and which would convert the working mining element into a privileged section of the community. We dealt last week with the causes—the impossible demands of the Miners' Federation—that led up to the strike. The concession of the demands to-day would mean that at no time would it be possible to restore the coal industry to an economic basis without a repetition of the serious trouble which has now to be met, and settled one way or the other on such fair terms as the interests of the coal industry and the nation can permit.

There are two things that stand out in bold relief from last week's happenings, endeavours, and resistance to these endeavours. One is the vile measures to which some of the so-called leaders of labour will go to gain their self-devised ends; and the other is that, in the ranks of industrial employees, there is a substantial section who are utterly sick of the Bolshevik tendencies and methods of certain of their leaders, and whose commonsense recognition of facts and the conditions of the country are leading them into revolt against those who have got the upper hand in the counsels of their organizations. Among the miners themselves, there are numbers, and the numbers are growing, who are in opposition to their leaders in their persistent idiotic decision of last week to allow mines to be destroyed or rendered unworkable (without an immense amount of money and time is spent on them) by removing the pump-men. And when it came to be known that the Miners' Federation made it a condition precedent to pumping operations being renewed (where men loyal to reason and volunteers were not at work) that two fundamental principles should be accepted—a national wages board and a national pool—the country were indignant and horrified. That is to say, the wicked destruction should only be discontinued on the concession of two of the three points on which the strike had taken place—the other one being the subsidizing of the industry in order to maintain the miners' wages. The wanton sacrifice went on day by day; the leaders stupidly looking upon it as the most effective bargaining weapon they possessed. What an admission! Diabolical force the only argument they could find with which to attempt to compel the acceptance of their claims! This attitude went on until Saturday; and so utterly abandoned were the extreme men of the rank-and-file, and so disregardless were they of the consequences and penalties of the fatuous policy of their leaders, that there was sporadic intimidation of the men who were working to save the mines, and even violence was resorted to in some areas. With it all, the Government stood firm to their resolve (they had the greater part of the men of the country at their backs) that pumping operations should be renewed as a condition precedent to a resumption of negotiations between the owners and the miners.

The callous policy and behaviour of the leaders of the Miners' Federation have done irretrievable harm to the cause of organized labour. Perhaps it is a good thing. It has shown a red light to those leaders who dwell in a firm belief in the anti-British policy of excess. Things looked blacker than ever on Friday night when it became known that the Triple Alliance had decided upon a general strike of railway and transport men on Tuesday evening this week if negotiations were not resumed, pumping renewal notwithstanding. Then came three things which there is no doubt had, combined, a salutary effect upon the leaders in the Triple Alliance. One was the activity of the Government in making preparations for the defence of the community against the rash and venomous exercise of organized power; the second was the hearty response of reservists and volunteers all over the country to protect it against the schemers of industrial disintegration; and the third—and probably this the most effective—was the publicly known decision of large bodies of the railway men to refuse to inflict further injury upon the country at the dictation of men who were, day by day, proving themselves its worst internal enemies. The leaders of the National Union of Railwaymen know now (if they had forgotten it) that in the rank-and-file of that body there are intelligent men who can think and judge for themselves, and who are fully cognizant of the fact that a preponderating section of the Executive of the Miners' Federation, when the opportunity was on their side, exercised their power with brutal force, and in a manner which has done much to bring the country and the coal industry to their present pass. They know, too, that there is no general attack on wages. Such a suggestion is one of the monstrous untruths that is of the stock-in-trade of those who personally fatten on inflammatory statements. All that is happening is that in the country there is general recognition of the fact that wages, like other expenditure, must be of an order—nothing more and nothing less—that an industry can afford, so as to allow it to flourish, and not to wither. To allow an industry to wither is not in the workers' interests; to cause it to flourish is. However, the N.U.R. leaders learned that there was a very strong feeling that, before the men whom they thought to command would strike in a body to support the miners, there should be a ballot. The years of selfishness of the miners have not made the sensible workers of other industries look upon them with any more friendliness.

Whatever the influences, on Saturday night there was agreement among the components of the Triple Alliance that the Government should call a conference of the coal-owners and the Miners' Federation on Monday to discuss the questions at issue between them; and the Federation issued a notice to the branches urging them to abstain from any action that would interfere with the measures essential to secure the safety of the mines, or that would necessitate the use of force by the Government. Once again common sense was in possession of the situation. What will happen—whether the renewed negotiations will be successful—cannot be foreshadowed at the time of going to press; but it is hoped that the intervention of reason will be successful, and will avert a worse catastrophe.

Further Orders and Therm Prices.

A considerable batch of further Orders under section 1 of the Gas Regulation Act has been forwarded to us for notice, by the courtesy of the Director of Gas Administration of the Board of Trade (Mr. H. C. Honey). It will be seen, by comparison with the notices when the applications were made, that the therm prices sought have, in two or three cases, been rather badly shaken. But, *per contra*, there is a further case where the price asked for has been granted; others where only fractions of a penny have been taken off. But there are others where a decapitation of 1d., 2d., or 3d. has occurred. There are no means of commenting on these cases, or of questioning the unjustness or commending the justness of the applications or of the decisions. The applicants and the Board are the only people who have the full information available for consideration and judgment. But whatever the initial decisions, after a period of trial, if the standard or maximum prices are found to work unfairly, or if conditions alter, the provisions of the Act allow the submission of a case for the amendment of terms. And the Board of Trade will not be disinclined to listen to the evidence of actual experience. At the start, the position must be largely experimental; and whatever the standard prices allowed, we do know that the financial positions of the concerns affected will be greatly improved compared with the experiences of the past few years, though, as a matter of fact, they have the right to be restored to the pre-war position. Differential prices, special clauses affecting public lighting, and prepayment meter charges are also dealt with in several cases. Regarding prepayment meters and fittings, the charges per therm are not stereotyped as in the old clauses. They vary. Figures such as $3\frac{3}{5}$d., $3\frac{3}{10}$d., and 3d. per therm for meter and fittings (including cooker) are found. The 3d. does not strike us as being any too high, though obviously allowing (calculating on 500 B.Th.U. gas) 3d. per 1000 c.ft. in excess of the old model allowance. The 3d. per therm is better for meter and fittings (without cooker). But when we get down to $2\frac{2}{5}$d. per therm for meter and fittings (including cooker), and 2d. for meter and fittings (excluding cooker), they are not better than the old charges —in fact, the former is worse, taking the 500 B.Th.U. basis and 1000 c.ft. Of course, there may be some special reasons for the lower figures; but new installation costs, repairs and maintenance, collection, and clerical work have all gone up considerably in every case. However, the further Orders show that the work of investigating the mass of statistics and estimates and issuing Orders is being pushed forward with considerable zeal.

Some Phases of Developed Responsibility.

The address that Mr. J. Wesley Whimster, the Engineer of the Bath Gas Company, delivered to the members of the Southern Association of Gas Engineers and Managers last Thursday shows that the industry is in possession of another man to add to the list of those whom we have known as of retiring disposition during assistant days, and afterwards as chief engineer and manager, who can be given credit for exercising good independence of judgment. The associated work of the gas industry is bringing such men to the front. The more this is done the better; for the thinkers are the men whose opinions it is in the interests of the industry should be made known. Never was this more necessary than now. New conditions, remarked Mr. Whimster in his address, crowd upon us so rapidly that each year seems to bring with it some outstanding feature. And not only each year, but each month, week, and even day. Every section of the address speaks of changed circumstances. The Vice-Chairman of the Bath Gas Company (Mr. S. Fox-Andrews), and our old friend—Mr. Whimster's predecessor in office at Bath, and now one of the Directors—Mr. C. Stafford Ellery, spoke of them in their after-luncheon speeches; and, contemplating them, they urged the fullest confidence and co-operation, and the cultivation of a friendly spirit, between manager and board. This is as things should be. There is no room to-day for anything but the most pronounced collaboration; and this can only be realized upon terms of the closest intimacy, and helpful sympathy and support from boards of directors. Likewise frequent association between the members of the profession—the more frequent the better just now, and not necessarily in formal meeting —is more valuable to-day than ever it was. The Southern Association have successfully developed this side of their work, as the two reports following that of the General Committee will show.

The President spoke of the new developments that will come from the Gas Regulation Act. There is to be dealing in therms now; and every undertaking has to settle the calorific power that it can most economically supply, having regard to the most available coal, plant conditions, and local requirements. This means that the responsibility of the engineer, and of the directors in making decision, has been extended. No more will it be a question of a universal standard of quality, and of plant that is more or less stereotyped. But while the internal responsibility increases, every engineer will want to know all that is to be known of new plants and processes from those who have the knowledge and the experience; and this he will only be able to obtain by association and the comparison of experiences. There is no question that the organized technical work of the industry, and the information published in the Technical Press, are going to be greater educators than ever for assisting in determinations governing internal procedure, policy, and process applications. The Act is the first legislative recognition that local gas supply conditions vary, and that what is a good economic policy in one district may not be so in another; and so the claims of association are strong which by frequent conference informs, and so gives to judgment a larger basis than would otherwise be the case. At the same time, we like to see independence of judgment; and, as already said, the address shows that such independence is a characteristic of the President. He indicated this particularly in his references to vertical and horizontal retorts, with which latter, using heavy charges, as his own working (employing Fiddes-Aldridge simultaneous charging and discharging machine) fully satisfies him, he can do as well as with verticals. He is not, however, convinced that with horizontal plant all undertakings are getting the utmost efficiency and obtaining the maximum results. Maximum realizable results must be found before embarking upon expensive extensions in these days of dear capital, materials, and labour. But in future the test will not be in terms of cubic feet per ton, but in terms of therms per ton, which will be a more decisive test of any type of producing plant. Every item in the manufacturing balance-sheet (from capital throughout) must be included in order to gauge the producing cost of these therms. And the comparison must be with the smaller number of vertical retorts that are required with steaming now than in the pre-war days without steaming. We are not partizans; but naturally, subject to cost, coal, and other conditions, the higher the yield of therms, whatever the system, the better.

One thing that is swaying judgment very much in these times, and is causing very close attention to processes (outside the vertical and horizontal systems) for use as auxiliaries, is the position of the secondary products markets. The period of high demand and prices for these under war and immediately subsequent conditions has ended. New conditions have arisen. They cannot be ignored; for we have to recognize now that the future positions of secondary products are not going to be a repetition of those that have faded away. As we read what the President had to say under the heads of coke, sulphate of ammonia, and tar, the picture developed is gloomy, though there is an attempt to relieve it somewhat by the use of a few dashes of the brighter pigments. Nevertheless, there was wisdom in the references. In respect of coke, a vigorous campaign to popularize its use is urged. This is good and proper. But the campaign requires to be accompanied by one that will improve the qualities of the coke in regard to ash and moisture. It is scandalous that Somerset coal that contained 11·9 p.ct. of ash before the war, and during the war 22·3 p.ct., should still be delivered containing 19·5 p.ct. Under such conditions, what other can be expected than that the heavy quantity of clinker in furnaces should cause laborious work in keeping the furnaces clean, while causing damage to furnace linings, and claiming more labour in the disposal of the refuse. The President largely overcomes the trouble by fixing his fire-bars in a perpendicular position instead of horizontally, and labour has been reduced. Good. But the proportion of coke that an undertaking has to dispose of is much greater than the quantity it uses itself; and it is of the outside industries and the other users or would-be users that the gas industry has chiefly to think. Hence the need for a concerted campaign by the gas industry aided by other industries to try to bring about a reduction of the incombustibles in coal. This is something worth trying for to improve the working

economy and coke quality. Into works' economies Mr. Whimster also penetrated; and those who want additional interest will find it in connection with the comments on distribution, gas consumption development, and housing schemes.

There was good endorsement during the reading of the address of many of the points made; and the figures as to business development have only to be looked at to see complete justification for the encomiums of the work of the President that fell from his Vice-Chairman and Mr. Ellery.

The Therm at the North British Meeting.

THERE will be no more "Informal Meetings" of the gas managers of Scotland. In lieu of them, the North British Association will henceforth hold a spring meeting; and the first of such gatherings took place last Friday at Johnstone, where the Corporation—their Engineer (Mr. James Dickson) being the President of the Association—gave the members a most hospitable reception. The technical proceedings were highly interesting; and the therm had quite a good innings in them. It put in an appearance in the address of the President; it had a paper all to itself, by Mr. George Braidwood, of Coatbridge; and Mr. Henry Rule's contribution was on the Tully gas-plant, which specializes in the production of therms and little else. The Johnstone Gas Department has not at present got so far as to say what its first declared calorific value will be. But, through circumstances, Johnstone (compulsorily and otherwise) has of late years been having experience of grades of gas varying between the extremes of 575 and 400 B.Th.U., and on at least one occasion as low as 380 B.Th.U.

On this experience, Mr. Dickson says one is warranted in stating that a declared calorific value of (say) 433 B.Th.U. would give, with moderate steaming in vertical retorts, an economic return, which would in the long-run benefit the undertaking and the consumers. With his vertical retort plant, and steaming, he could get a make at this calorific power of from 16,500 to 17,000 c.ft. per ton of coal handled, which figures would respectively represent 7,144,500 and 7,361,000 B.Th.U. per ton. There would be no advantage in making the lower quantity of gas of 433 B.Th.U., and little in making the higher quantity, as compared with what is being done at the present time—seeing that 456 B.Th.U. gas is now being made, with a production of 15,955 c.ft., which means 7,275,480 B.Th.U. per ton. Some of the economies of steaming are well illustrated by the working at Johnstone. Before steaming was adopted, the eighteen vertical retorts would produce daily 2587 therms; now the same retorts with steaming will yield 3845 therms—an increase of 1258 therms, or 48·62 p.ct. But the whole eighteen retorts are not now required. With the greater production of therms per retort and per ton, ten retorts to-day suffice—2136 therms being adequate to meet the demand. The economic effects of this in capital (particularly in these times), wear and tear, and working expenses are too obvious to need emphasizing by reference, besides which Mr. Dickson has now in his possession more margin of producing capacity than he expected to have when the retorts were originally installed. Before steaming, he used to make 10,000 c.ft. of 575 B.Th.U. gas, or 5,750,000 B.Th.U. per ton; now making 15,955 c.ft. of 456 B.Th.U. gas, he obtains per ton 7,275,480 B.Th.U.—an increase of 1,525,480 B.Th.U., or 26·5 p.ct. To have for sale 72¾ therms per ton of coal is a more attractive proposition than 57½ therms. Mr. Dickson does not believe in pressing steaming too far, because he finds this is only done at the expense of fuel consumption increasing in greater ratio than is warranted by the gain in therm yield per ton of coal. This is always a matter that will have to be determined by local requirements and the market circumstances of the time.

It was an excellent review of, and comment upon, the Gas Regulation Act which Mr. George Braidwood, of Coatbridge, gave the members. Where there was adverse criticism, it was only in respect of details; and the good impression one gets from the paper is that here the gas industry is parting from old obstructive legislation, and entering upon a more open life in opportunity. We have often commented upon the commercial advantage that there will be in the guarantee the consumers will have in securing what they pay for by purchasing on the therm basis. They are by this assured of a "square deal;" and gradually the old suspicion will be relieved, and greater confidence will take its place. We know there are some, or rather a few, gas men who do not believe this. In their case, vision, it seems to us, has been clouded by unusual pessimism. They do not believe that people who buy electricity by the unit, and people who prefer motor buses and electric trams to the old horse vehicles, are capable of buying gas by the heat unit, while they are by the cubic foot purchasing a quantity of a value of which they have no exact knowledge or assurance. People have in the last few years shown a greater adaptability to change than ever before. The consumer is going to be more carefully looked after in the future than in the past. But here is a point over which Mr. Braidwood finds ground for a little grievance. The forfeiture clause is regarded as unfair to gas undertakings, in that it imposes penalties when the quality of the gas falls below 5 p.ct. of the declared value; while an undertaking will get no corresponding advantage when the supply is above the declared calorific value. We must not be too critical over this point. The 5 p.ct. margin has its value to gas suppliers; and anyway the conditions have not been altered in having to provide a safety margin which is calculated in the price per therm charged. Under the old standards of illuminating power or calorific value, the gas had always to be in excess of the standard for safety, especially in connection with illuminating power, on account of the losses in transit. But if there is a general desire to complicate matters by trying to get special monetary recognition for heat units additional to the declared value, then perhaps a suggestion may be found in the exceptional purity clause of the South Metropolitan Gas Act of 1920, which provides that if the Chief Gas Examiner certifies in respect of any year or half year that the testing of the gas has shown it to contain, on an average, less than 1 part by volume of carbon bisulphide vapour per 40,000 volumes of gas, "the sum payable by "consumers taken into calculation in determining the con- "sumers' share for the purposes of section 19 of this Act "shall be deemed to have been ¼d. per standard unit less "than the sum actually payable." Some advantage might be given (by securing an amendment of the Act) for excess heat units, in respect of calculating dividends, on the certificate of the Chief Gas Examiner. But we rather think there will be a general preference not to complicate matters by raising this question at the present juncture.

One other criticism by Mr. Braidwood is that there should have been provision for gas examiners satisfying the Gas Referees as to their competency to carry out their prescriptions. By the Act the examiner appointed is to be a "competent and impartial person." If he is found not to be so, then, of course, there can be appeal, though this might prove to be rather an invidious matter. It would, of course, have been much better that examiners, like meter inspectors, should have their competency proved. Speaking of complaints of gas supply, the author is of opinion that many complaints are due to service-pipes of insufficient capacity which are not the property of the gas suppliers. They are usually their property in this part of Great Britain, whatever may be the case in Scotland. However, where they are not, it is Mr. Braidwood's view that gas undertakings—and there is full agreement—should have the power to compel owners, where new buildings are being erected, to provide and maintain service-pipes of proper size. He is of opinion that greater control in respect of piping is sure to come. There are very good indications of this. The paper also deals with the making of the therm, and then gives information as to the therm price applications of the Coatbridge and Stirling Companies, and what happened in connection with them. The Coatbridge Gas Company asked for 12·55d. per therm, and got 11·8d.; and the Stirling Company desired 15d., and obtained 14·6d. The former Company have declared 450 B.Th.U. as the calorific value, and the latter 475 B.Th.U. In this connection, we are pleased to see this piece of independent and voluntary testimony, because it bears out what we said in the "JOURNAL" on a previous occasion: "While the prices per therm fixed "are lower than those requested, the Companies feel that "an honest attempt has been made by the Board of Trade "to give justice under the Act both to the Companies and "to those who have the consumers' interests at heart, while "new capital will now be more readily procurable and "assured of a fair return."

It was only recently that Mr. Henry Rule gave us, in compact and informative manner, the particulars, under his conditions of working, of the results realized with the Tully plant at Kelty, which he uses as an auxiliary to his coal-gas plant. Mr. Rule is of an inquiring mind. [illegible]

wants to find out all he can about the plant, and what is economically possible with it. His short contribution to the proceedings was in the nature of a supplementary statement to the paper before the Scottish Junior Association [see "Journal" for Dec. 22] as to his further investigations into the working of the plant. During the coke slump, he has been largely using coke in the plant, and has been getting a make of 50,500 cubic feet of 297 B.Th.U. gas per eight-hour shift (we believe that approximately 1 ton of fuel is used), which means 14,998,500 B.Th.U.; and the gas is quite good for dilution purposes. He has also been experimenting with low grade fuel — table pickings and "foul" coal; but he has only been able to get from this low-grade material some 26,000 c.ft. of 305 to 315 B.Th.U. gas per eight-hour shift, or (say) 8,000,000 B.Th.U. This is a considerable reduction of plant efficiency and capacity; and it means increased wear and tear on the brickwork, increased cost of wages, and a larger amount of clinker and ash to be disposed of. But there is an attraction in the cost of the low-grade fuel; and, though Mr. Rule is not binding himself to anything, he is going to continue his investigations in this direction. Notwithstanding the low cost of the fuel, we question whether this will compensate for loss of production, and the higher expenses in other directions. In this contribution, the author emphasizes the importance of adequate pressure. When lower-quality gas was first supplied, there were complaints in part of the town. But a new feeder main has been laid to the affected area; and with a pressure of 3 in. available, the complaints have been cured. All these investigations into therm production, in different circumstances of plant, fuel, and local conditions, are helpful at this particular juncture in the shaping of opinion and action.

Unauthorized Use of Names in Evidence.

It is customary in the Law Courts not to pay attention to statements alleged to have been made by a party who is not present to confirm or deny them. To accept such statements might lead to serious and irrevocable injustice being done. In view of this, we refrained, when publishing on March 16 the evidence given by Mr. Robert Mond before the Carbon Monoxide Committee, from commenting on a statement made by him in reply to a question by Dr. Gray, one of the members of the Committee, to the effect that Mr. H. James Yates agreed with his views on a certain point. It was clear that this was a case in which Mr. Mond had no direct authority to use Mr. Yates's name. The question that Dr. Gray put was: Did witness mean to say that it would not be possible to adjust present-day fittings to burn gas with in it considerably less than 20 p.ct. of methane? Mr. Mond's reply was that they had, on the British Association Fuel Economy Committee, Mr. H. James Yates who agreed with the views that he (witness) then expressed. It must have been obvious to those professional gas men who read our report, and knowing Mr. Yates as the head of the largest of gas-appliance making enterprises in the country, that he would not have confirmed Mr. Mond's statement, if only for the simple reason that innumerable examples of his firm's productions are being used to-day with gas containing considerably less than 20 p.ct. of methane. Naturally, Mr. Yates felt that his position in the matter was open to misinterpretation and misunderstanding; and so he protested against the unauthorized use of his name. Mr. Mond has, however, expressed his sincere regret if he used Mr. Yates's name in a manner not intended. It appears that he was called upon to give evidence (through Prof. Bone's illness and operation) with practically no notes or any opportunity of conferring with his fellow members of the Fuel Economy Committee as to the evidence to be submitted. It was owing to this that he used as one of his arguments in favour of the maintenance of 20 p.ct. of methane in gas, the danger of back-firing, and the extinguishing of the gas, thus permitting the escape of carbon monoxide into dwelling-rooms. Of course, there he was speaking in opposition to experience. However, in his letter to Mr. Yates, he says: "One of the "members of the Committee asked me whether we had "considered the improvements in gas-burning appliances "to prevent this; and I then replied that, 'in spite of our "having had the benefit of your advice and criticism on the "General Committee, I could not recollect that we had "any evidence that met this point.' I gave my evidence in "a conversational manner; and I have no notion how it "looks in print. I very much regret I had no opportunity "of consulting you on the matter before; but I took it for "granted that you also approved of our general recommendations, as embodied in our last two reports." This statement completely exonerates Mr. Yates from having authorized the use of his name in support of the statement made; and, as a matter of fact, we have reason to know that he has, through pressing business, been unable for some time past to take an active interest and part in the work and proceedings of the Committee.

Oxygen and Gasification.

Further reflection on the paper by Mr. E. A. W. Jefferies, of Worcester, Mass., on "Gas Making with Cheap Oxygen," suggests two or three points in addition to those submitted in the editorial columns last week. It is interesting to note that, although the author made all his calculations somewhat differently from Prof. Cobb and Mr. H. J. Hodsman in their Institution paper, his results are substantially the same as theirs—anyway, the calculations in the one paper to a large extent confirm those in the other. Looking at the results of these calculations, we may venture to say that both Prof. Cobb and Mr. Hodsman would be inclined to express their confidence that, as soon as the cost of oxygen could be counted upon at (say) 1s. per 1000 c.ft.—if less, so much the better—gasification by the steam-oxygen process would only need the working-out of practical details in the design of the generator, &c., in order to establish itself as the method for the production of gas. Their faith in the process is strong; and their opinion seems to be shared by certain other leading gas men who have turned consideration in this direction by the studies of the authors of the Institution paper. However, as we pointed out last week, the scale of oxygen production has an important bearing upon its cost; and it is in the oxygen producing plant, which must have a capacity at least one-fifth of the maximum gas demand upon a works, that practical difficulties present themselves most to us for all gas-works coming below those of front rank in magnitude of operations. Above, we have mentioned 1s. per 1000 c.ft. of oxygen; and between the 7½d. of Mr. Jefferies and the 1s. is a margin of 4½d. (and nearly 7d. with a 3 million cubic feet oxygen plant), which margin would perhaps make a greater attraction still—with the predicted substantial and collateral advantages of the process—to works of a size below the largest to adopt the process. Meantime ordinary complete gasification plants will continue to receive adoption, owing to several considerations—too well known nowadays to need repetition here. On all hands, we see a tendency to investigate and to obtain more knowledge of such plants, notwithstanding that (1) there is a certain complication of working arising from any plant that requires periodical reversals, and that (2) complete gasification alone does not show any very large thermal advantages compared with independent retorts followed by gasification of the coke in water-gas generators. On the other hand, it must be confessed that with the oxygen process the simplification and speed of the continuous working in a single generator would count for a great deal, and the thermal economy obtainable promises to be well worth realizing. Indeed, it is so high—it may well be over 90 p.ct. —that it comes as near the ideal as one can reasonably expect in any industrial operation on the large scale.

Coke Supplies and the Strike.

The London Coal and Coke Committee have, in view of the coal strike, taken a step which might be copied by similar Committees in other areas. They have made it widely known that there are large quantities of coke at the gas-works in and about London, and that it would help in coal conservation if coke were purchased for household purposes. The Mines Department, in a letter to those controlling light and water undertakings, hospitals, sewage works, &c., urges the vital necessity of the utmost economy in the use of coal, and suggests, where possible, the substitution of coke, briquettes, and patent fuel. All consumers of gas are likewise urged to restrict and economize in every way their consumption of fuel and power.

Declarations of Calorific Power.

We commenced last week the publication of the declarations of calorific power by those gas undertakings that have already

received Orders under section 1 of the Gas Regulation Act [p. 41]; and when and as fresh ones appear, the announcements will be continued. It will be noticed that, so far, the favoured figures range between 450 and 480 B.Th.U. The Aldershot Company announce 450 B.Th.U. for the current quarter; and it is proposed to retrace steps to 500 B.Th.U. as from July 1. But the 450 to 480 B.Th.U. declarations are quite in accord with anticipations. Existing conditions are compelling factors; and it is better to proceed by prudent gradations than to incur trouble by excessive zeal. The best economic conditions have to be found for each supply area, subject to varying circumstances at the works and in the district.

Increasing Gas Business and Capital Outlay.

All men concerned at the commercial end of gas supply should read the contribution on gas publicity that Mr. Frank R. Ayre, the Publicity Assistant to the Birmingham Corporation Gas Department, made to the Midland Juniors last week. It is a long paper; but it is full of good points. At the present time, there is, of course, some reluctance to push out too hard for new gas business; but it is clearly the opinion of Mr. Ayre that insufficient consideration is given normally to local publicity, which should run parallel with the national exploitation and cultivation work which is done by the British Commercial Gas Association in directions and quarters where the individual gas undertaking cannot operate. The author of the paper confines himself largely to local publicity. One question he asks is, Is every consumer using as much gas as he can profitably consume? It is easy enough to give an answer in the negative. Here an important point can be made. Capital expenditure is costly to-day. This being so, the first direction in which to search for new business is not among those who are not already gas consumers (though these should not be totally neglected), but among those who have already service-pipes laid and meters fixed. If the accounts of consumers in a single street are analyzed, it will be found there is a great disparity between the amounts of their consumptions, which tells a tale of opportunity. Some interesting figures regarding this point are given in the Presidential Address of Mr. J. Wesley Whimster to the Southern Association. From a recent census taken of 63 nine-roomed houses, the average consumption was 50,000 c.ft. per annum—the maximum being 178,000 c.ft., and the minimum 13,000 c.ft. This shows the scope there is in these houses alone for increasing the minimum, and so raising the average. In this respect, saturation-point is a long distance ahead. Until the greatest useful employment of gas is reached, the capital expenditure on the service to a house is not earning its maximum. That is what should be aimed for in these days when capital has to be spent in the most economical manner. This is the direction for present local publicity.

FURTHER ORDERS ISSUED UNDER THE GAS REGULATION ACT.

From the Director of Gas Administration of the Power Transport and Economic Department of the Board of Trade (Mr. H. C. Honey) have been forwarded copies of further Orders issued under section 1 of the Gas Regulation Act, 1920. We give below particulars of these Orders in so far as the terms differ from the Gas Light and Coke Company's Order, which was given *in extenso* in the "Journal" for March 30 last (p. 799). In the case of the Scotch companies, notice of the "declared value" is to be given in the "Edinburgh Gazette." The dates on which the Orders shall come into operation are given in parentheses.

Aldershot Gas, Water, and District Lighting Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 17⅞d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4½.

Differential Prices.

(1) The sum of 3⅜d. per therm shall be substituted for the sum of 1s. 6d. per 1000 c.ft. mentioned in section 8 of the Aldershot Gas, Water, and District Lighting Act, 1909.

(2) The sums of 3⅜d. per therm and 2⅜d. per therm respectively shall be substituted for the sums of 1s. 6d. and 1s. per 1000 c.ft. mentioned in section 6 of the Aldershot Gas, Water, and District Lighting Act, 1918.

(3) The sums of 1½d. and ⅜d. respectively shall be substituted for the sums of 6d. and 3d. mentioned in section 13 of the Aldershot Gas, Water, and District Lighting Act, 1918. (April 1.)

Bedford Gas Light Company.

After the declared date the standard price in respect of gas supplied by the undertakers shall be 15d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4½. (March 24.)

Brentford Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 17⅛d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4⅜.

Differential Prices.

It is provided that the sum of 2⅛d. per therm and ⅜d. per therm respectively shall be substituted for the sums of 1s. 2d. per 1000 c.ft. and 2d. per 1000 c.ft. mentioned in section 57 of the Brentford Gas Act, 1914.

Charges for Gas Supplied to Public Lamps.

The words "per therm" shall be substituted for the words "by the 1000 c.ft." in section 34 of the Brentford Gas Act, 1868. (March 31.)

Cardiff Gas Light and Coke Company.

As from the declared date, the maximum prices in respect of gas supplied by the undertakers shall be:

(*a*) Within the city of Cardiff and the urban district of Penarth 16⅜d. per therm;

(*b*) Within the rural district of Llandaff and Dinas Powis (except the parish of Pentyrch) shall be 17d. per therm;

(*c*) Within the remainder of the limits of supply of the undertakers shall be 18⅛d. per therm.

Price of Gas Supplied to Public Lamps.

The words "per therm" shall be substituted for the words "per 1000 c.ft." in section II. of the Cardiff Gas Light and Coke Company's Act, 1870.

Charge for Hire of Fittings.

The price of 3⅜d. per therm shall be substituted for the price of 1s. per 1000 c.ft. mentioned in sub-section (1) of section 35 of the Cardiff Gas Act, 1906. (April 6.)

Coatbridge Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 11⅛d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4½. (April 4.)

Colchester Gas Company.

After the declared date,

(*a*) The standard price in respect of gas supplied by the undertakers shall be 15½d. per therm;

(*b*) The sums of 1½d. per therm and 1⅜d. per therm respectively, shall be substituted for the sums of 6d. per 1000 c.ft. and 9d. per 1000 c.ft. mentioned in paragraphs (B) and (C) respectively of sub-section (2) of section 45 of the Colchester Gas Act, 1916.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4⅜.

Price of Gas for Public Lamps.

As from the declared date the price to be charged by the undertakers to the Colchester Corporation in respect of gas supplied for the public lamps shall be less by the amounts hereinafter mentioned than the lowest price for the time being charged by the undertakers in respect of gas supplied by them within the borough of Colchester for lighting purposes only to persons (other than Government departments) who shall burn the same by meter other than a prepayment meter—that is to say:

In any year ending on the 31st day of December in which the total number of therms supplied by the undertakers to the Corporation and to be paid for by the Corporation

(*a*) shall exceed 25,000 therms and shall not exceed 45,000 therms by ⅜d. per therm.

(*b*) shall exceed 45,000 therms by 1½d. per therm.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied and the maximum rate of charge shall be

For a prepayment meter and fittings (including a cooking stove) 3⅜d. per therm;

For a prepayment meter and fittings (not including a cooking-stove) 3d. per therm.

(*b*) The charge for the hire of a prepayment meter without fittings shall be either a sum of money calculated according to the number of

therms supplied (when the maximum rate of charge shall be 1⅛d. per therm) or at the rate of 10 p.ct. per annum on the cost of the meter, whichever shall be the higher.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be) and the cost of collection and other costs incurred by the undertakers in connection therewith. (March 24.)

Commercial Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 15⅜d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by $4\frac{9}{10}$. (April 1).

Corbridge Gas Company.

After the declared date, the standard prices in respect of gas supplied by the undertakers shall be 17⅜d. per therm within the parishes of Corbridge and Dilston (east of the Devil's Water) and 19⅛d. per therm beyond the said parishes.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 5½. (March 29.)

Eastbourne Gas Company.

After the declared date,

(*a*) The standard price in respect of gas supplied by the undertakers shall be 18⅜d. per therm.

(*b*) The sum of 1d. per therm shall be substituted for the sum of 5d. per 1000 c.ft. mentioned in section 4 of the Eastbourne Gas Act, 1909.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4⅜.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied; and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove) 2⅜d. per therm;

For a prepayment meter and fittings (not including a cooking stove) 2d. per therm.

(*b*) The maximum charge for the hire of a prepayment meter without fittings shall be at the rate of 10 p.ct. per annum on the cost of the meter.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be), and the cost of collection and other costs incurred by the undertakers in connection therewith. (April 4.)

Falmouth Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 19⅜d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4¾. (April 7.)

Great Yarmouth Gas Company.

As from the declared date, the maximum price in respect of gas supplied by the undertakers shall be 21d. per therm. (March 24.)

Hexham Gas Company.

After the declared date,

(*a*) The standard price in respect of gas supplied by the undertakers shall be 15⅜d. per therm.

(*b*) The price of 15d. per therm shall be substituted for the price of 3s. per 1000 c.ft. mentioned in section 29 of the Hexham Gas Act, 1903.

(*c*) The sum of 2d. shall be substituted for the sum of 1s. mentioned in the third proviso to section 29 of the Hexham Gas Act, 1903.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4⅜. (April 4.)

Ipswich Gas Light Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 15⅛d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by $4\frac{7}{10}$. (April 6.)

Newark Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 14⅜d.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4.

Differential Price.

The sum of 1⅛d. per therm shall be substituted for the sum of 6d. per 1000 c.ft. mentioned in section 10 of the Newark Gas Act, 1919.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied; and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove), 3⅜d. per therm;

For a prepayment meter and fittings (not including a cooking stove), 3d. per therm.

(*b*) The charge for the hire of a prepayment meter without fittings shall be either a sum of money calculated according to the number of therms supplied (when the maximum rate of charge shall be 1⅛d. per therm), or at the rate of 10 p.ct. per annum on the cost of the meter, whichever shall be the higher.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be), and the cost of collection and other costs incurred by the undertakers in connection therewith. (April 4.)

Penistone and District Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 16⅜d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 5.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied; and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove), 3⅜d. per therm;

For a prepayment meter and fittings (not including a cooking stove), 3d. per therm.

(*b*) The charge for the hire of a prepayment meter without fittings shall be either a sum of money calculated according to the number of therms supplied (when the maximum rate of charge shall be 1⅛d. per therm) or at the rate of 10 p.ct. per annum on the cost of the meter, whichever shall be the higher.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be), and the cost of collection and other costs incurred by the undertakers in connection therewith. (April 7.)

Pinner Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 17⅜d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4⅛. (April 1.)

Preston Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 16⅜d. per therm.

For the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by $4\frac{7}{10}$.

Maximum Prices.

(1) The price of 18⅜d. per therm shall be substituted for the price of 4s. 2d. per 1000 c.ft. mentioned in section 56 of the Preston Gas Act, 1865, and the prices of 20⅜d. per therm and 19⅜d. per therm respectively shall be substituted for the prices of 5s. per 1000 c.ft. and 4s. 7d. per 1000 c.ft. mentioned in section 30 of the Preston Gas Act, 1879; and the price of 20⅜d. per therm shall be substituted for the price of 5s. per 1000 c.ft. mentioned in section 6 of the Preston Gas Act, 1894.

(2) The sum of ⅜d. per therm shall be substituted for the sum of 2½d. per 1000 c.ft. mentioned in the last paragraph of section 47 of the Preston Gas Act, 1894.

Discounts to Consumers.

The words "ten thousand therms" shall be substituted for the words "two million cubic feet" in section 46 of the Preston Gas Act, 1894.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to

the number of therms supplied; and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove), 3d. per therm;

For a prepayment meter and fittings (not including a cooking stove), 2½d. per therm.

(*b*) The maximum charge for the hire of a prepayment meter without fittings shall be at the rate of 10 p.ct. per annum on the cost of the meter.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be), and the cost of collection and other costs incurred by the undertakers in connection therewith. (March 24.)

St. Albans Gas Company.

After the declared date, the standard price in respect of gas supplied by the undertakers shall be 17⅛d. per therm.

For the purpose of ascertaining the authorized rate of dividend for the half year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the half year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 4½. Provided that the dividend payable in respect of any half year during any part of which the price charged by the undertakers shall exceed 16⅝d. per therm shall not be increased above the standard rate. (April 1.)

Sheringham Gas and Water Company.

As from the declared date, the maximum price in respect of gas supplied by the undertakers shall be 19½d. per therm.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied; and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove), 3$\frac{3}{10}$d. per therm.

For a prepayment meter and fittings (not including a cooking stove), 2½d. per therm.

(*b*) The charge for the hire of a prepayment meter without fittings shall be either a sum of money calculated according to the number of therms supplied (when the maximum rate of charge shall be 1$\frac{7}{9}$d. per therm), or at the rate of 10 p.ct. per annum on the cost of the meter, whichever shall be the higher.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings, or of the meter (as the case may be), and the cost of collection and other costs incurred by the undertakers in connection therewith. (April 5.)

Southampton Gas Light and Coke Company.

As from the declared date, the maximum prices in respect of gas supplied by the undertakers shall be 16⅜d. per therm and 18½d., and these prices shall respectively be substituted for the prices of 3s. 6d. and 4s. 6d. mentioned in section 5 of the Southampton Gas Act, 1898. (April 1.)

Stirling Gas Light Company.

After the declared date,

(*a*) The standard price in respect of gas supplied by the undertakers shall be 14⅜d. per therm.

(*b*) Prices of 15d. and 14⅜d. respectively shall be substituted for the prices of 3s. 4d. and 3s. mentioned in section 15 of the Stirling Gas Order, 1904, as confirmed by the Gas Orders Confirmation (No. 3) Act, 1904.

For the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by 5. (April 1.)

Torquay Gas Company.

As from the declared date, the maximum price in respect of gas supplied by the undertakers shall be 19d. per therm. (April 5.)

Westgate and Birchington Gas and Electricity Company.

As from the declared date, the maximum price in respect of gas supplied by the undertakers shall be 20d. per therm.

Charges for Prepayment Meters.

(1) The undertakers may demand in respect of gas supplied through a prepayment meter a not greater charge than in respect of gas supplied to private consumers within their limits of supply through any other kind of meter or by any other method of supply.

(2) (*a*) The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the number of therms supplied and the maximum rate of charge shall be:

For a prepayment meter and fittings (including a cooking stove) 3d. per therm.

For a prepayment meter and fittings (not including a cooking stove) 2½d. per therm.

(*b*) The charge for the hire of a prepayment meter without fittings shall be either a sum of money calculated according to the number of therms supplied (when the maximum rate of charge shall be 1½d. per therm) or at the rate of 10 p.ct. per annum on the cost of the meter whichever shall be the higher.

(*c*) The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meter and fittings or of the meter (as the case may be) and the cost of collection and other costs incurred by the undertakers in connection therewith, (March 24.)

MR. SAMUEL GLOVER'S RETIREMENT.

The Future Management at St. Helens.

It has long been known by his professional friends that it was Mr. Samuel Glover's intention to retire from the management of the St. Helens Gas-Works on the completion of his fifty years connection with the town. This somewhat unique event in the annals of the gas industry will occur at the end of this month; and some allusion to the matter appears in a report elsewhere to-day of last Wednesday's meeting of the St. Helens Town Council.

The official record of the matter in the books of the Corporation is in the following terms:

"At the Gas and Lighting Committee meeting the Committee considered the arrangements to be made on the retirement of the Engineer and General Manager, Mr. S. Glover, on the 1st of May, 1921.

"Resolved that, in connection with the retirement of Mr. S. Glover, M.Inst.C.E., on the 1st of May next, having completed fifty years' continuous service at the gas-works—five years with the St. Helens Gas Company and forty-five with the Corporation, during the last thirty-three years of which he held the responsible position of Engineer and General Manager—this Committee desire to place on record their appreciation of the faithful manner in which Mr. Glover has carried out his duties during such period, and to express the hope that he may long enjoy the rest and retirement which he has so well merited.

"Resolved that arrangements be made for Mr. S. Glover to act in the advisory capacity of Consulting Engineer for the gas-works for a period of twelve months ending the 1st of May, 1922, at a fee of £250.

"Resolved that on the retirement of the Engineer and General Manager (Mr. S. Glover), the Parliamentary Committee be recommended to increase the salary of Mr. F. E. Ward, the Deputy Gas Engineer, from £475 per annum to £600 per annum as from the 1st of May, 1921, and to review Mr. Ward's position at the end of twelve months from that date."

Dearer Gas in Edinburgh.

At their meeting on Thursday last the Edinburgh Corporation Gas Committee agreed to recommend that the price of gas to ordinary consumers be increased from 5s. 4d. to 5s. 8d. per 1000 c. ft., as from April-May to October-November. In the course of an explanatory memorandum, the Gas Engineer (Mr. Alexr. Masterton) says that considerable dubiety exists as to the prices which may be obtainable for residual products—especially for tar and sulphate of ammonia which, as recently as last month, had suffered a big fall. To what extent these values may still further fall no one is able to say. With reference to coke, there is at present a large surplus on the market, due to the falling-off in demand for export purposes. Consequently many gas-works have large stocks of coke which they are disposing of at reduced rates. To meet this competition, he had been compelled to follow suit, and bring the price down by 5s. per ton.

London and Southern District Junior Gas Association.

Last Saturday afternoon the members of the above Association paid a visit to Beckton, the chief works of the Gas Light and Company. The party numbered 80, and was met at the entrance of the works by Mr. W. B. Leech, the Engineer of the station. On behalf of the Governor and Directors of the Company he extended a very hearty welcome to the visitors. He trusted they would see much of interest from a constructional point of view, though he wished the visit had been arranged for a later date, when some of his schemes might have been completed. Mr. J. S. Thorman, the Deputy Station Engineer, Messrs. W. Grogono, C. Chaplin, Assistant Engineeers, and Mr. E. Edwards, the Chief Chemist, assisted Mr. Leech in the inspection. After their welcome the party boarded a train in waiting and commenced their extensive tour. [Owing to pressure on our space to-day, we regret the description of the interesting visit must be held over till next week.]

Manchester and District Junior Gas Association.

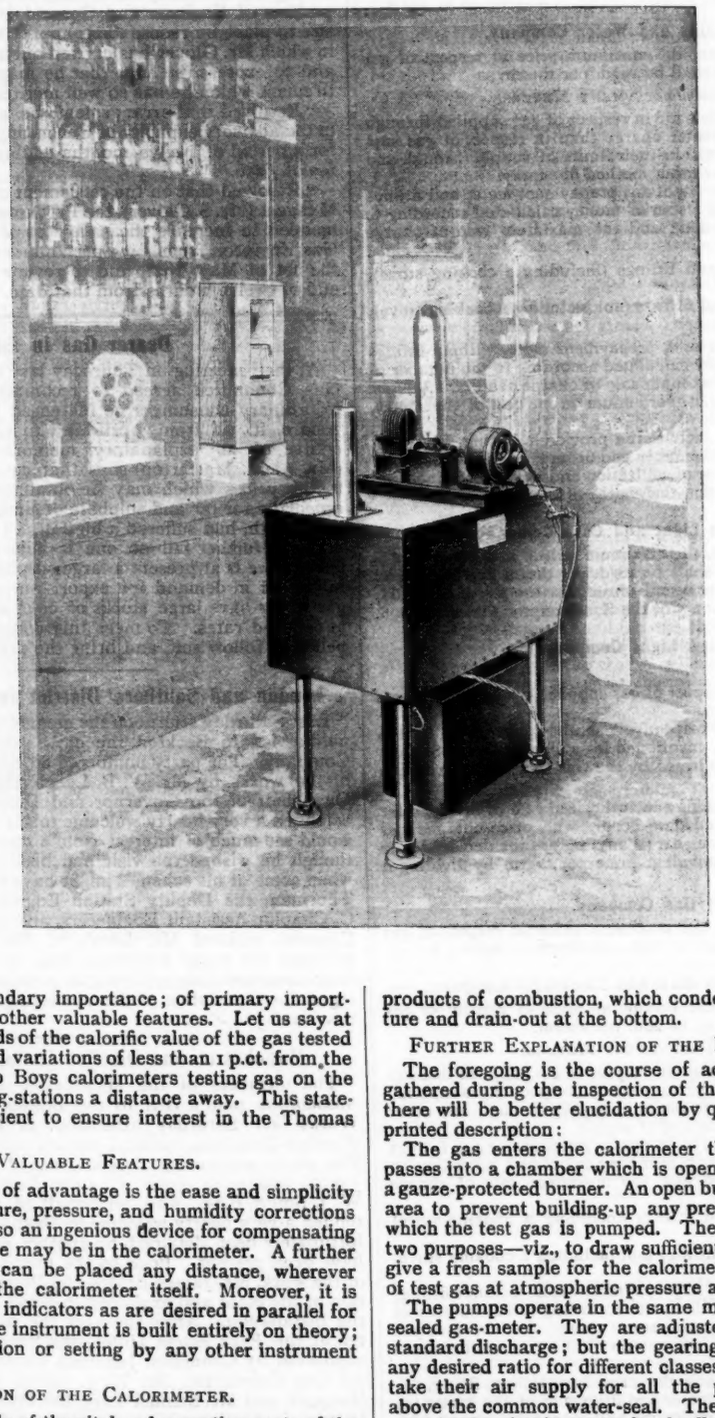
The members of the Manchester and District Junior Gas Association paid a visit to the Bolton Corporation (Gas Street) Works last Saturday afternoon, to view the installation of Woodall-Duckham vertical retorts now in course of erection. The party, numbering sixty-six, met at the Gas Street works at 3 p.m., and were received by the Engineer and Manager, Mr. W. J. Smith, B.Sc., who, on behalf of the Gas Committee, extended a very hearty welcome to them. His Chairman had unfortunately been detained by another engagement, or he would have been present. Prior to the members viewing the progress of the work, Mr. James Bridge, the President, gave a full description of the plant and explained in detail the drawings illustrating the installation. After the visit the party were entertained to tea at the Pack Horse Hotel—the President presiding. He was supported by Councillor Jonathan Taylor, the Vice-Chairman of the Gas Committee, Mr. W. J. Smith, B.Sc., the Engineer and Manager, and Mr. Samuel Tagg, the President of the Manchester District Institution of Gas Engineers. Further references to the visit must be deferred.

THE THOMAS RECORDING CALORIMETER.

We have had the privilege of inspecting in operation the first Thomas calorimeter which has been experimentally installed in this country, and which continuously records graphically the total heat values of the gas. It has been set-up in the laboratory of the Gas Light and Coke Company at their Horseferry Road Station. The invention is an American one, and is being exploited by the Cutler-Hammer Manufacturing Company, of Milwaukee and New York; and information concerning it can be obtained at the offices of Messrs. Humphreys and Glasgow, Ltd., of 38, Victoria Street, S.W., who, it will be remembered, are the agents in this country for the Thomas gas-meter, which, by the way, has already received highly favourable adoption in British gas-works.

Less Than One Per Cent. Variation.

However, the place of origin of an instrument such as a recording calorimeter is of secondary importance; of primary importance is its accuracy, and other valuable features. Let us say at once that inspected records of the calorific value of the gas tested by this calorimeter showed variations of less than 1 p.ct. from the average daily tests of two Boys calorimeters testing gas on the same trunk main at testing-stations a distance away. This statement alone will be sufficient to ensure interest in the Thomas calorimeter.



Other Valuable Features.

One of the main points of advantage is the ease and simplicity with which all temperature, pressure, and humidity corrections are avoided. There is also an ingenious device for compensating whatever heat losses there may be in the calorimeter. A further fact is that the recorder can be placed any distance, wherever most convenient, from the calorimeter itself. Moreover, it is possible to have as many indicators as are desired in parallel for the one calorimeter. The instrument is built entirely on theory; and no arbitrary calibration or setting by any other instrument is needed.

Description of the Calorimeter.

It is seen that the whole of the vital and operating parts of the calorimeter are assembled in a tank containing water, the variation of the level of which does not make any difference over quite wide limits, as it affects all the meters the same. But, as a matter of fact, the level is kept constant by an overflow weir. Attention is first drawn to the wet meters, which are geared together, and are driven by a small motor situated on top of the tank. These meters supply the gas and air, and, being geared together, the gas and air are always delivered in fixed volumetric proportions. There is a small gas-meter of a capacity of only about ½ c.ft. per hour at atmospheric pressure. The gas mixes with the primary air which comes from a small pump or meter at the other end of the tank, and which furnishes the whole of the primary and secondary air. The mixture of primary air and gas flows to the burner, and there meets the secondary air. No trouble whatever is experienced from the striking-back of the flame. A larger meter furnishes air for cooling the products of combustion back to inlet temperature and absorbing the heat of combustion. It comes up with a water-seal action into the calorimeter, past an electrical thermometer, and then the air is reflexed and absorbs the heat, and flows out past the hot thermometer. The heat absorbing air comes out of the top, and is kept separate from the products of combustion, which condense back at inlet temperature and drain-out at the bottom.

Further Explanation of the Method of Operation.

The foregoing is the course of action of the gas and air, as gathered during the inspection of the calorimeter; but perhaps there will be better elucidation by quoting fuller details from a printed description:

The gas enters the calorimeter through a small orifice, and passes into a chamber which is open to the atmosphere through a gauze-protected burner. An open burner is provided of sufficient area to prevent building-up any pressure in the chamber from which the test gas is pumped. The orifice and chamber serve two purposes—viz., to draw sufficient gas from the main line to give a fresh sample for the calorimeter, and to furnish a supply of test gas at atmospheric pressure at the pump inlet.

The pumps operate in the same manner as an ordinary water-sealed gas-meter. They are adjusted and calibrated to give a standard discharge; but the gearing may be changed to provide any desired ratio for different classes of service. The air-pumps take their air supply for all the pumps direct from the air above the common water-seal. The pumps are designed so that any changes in the water-level affect their displacements alike.

Therefore the exact water-level is not essential within 1-10th of an inch. The important requirement is that the system is level. Two levelling points and the overflow weir are used for levelling. To insure the maintenance of the water-level, a small chain pump raises water from an auxiliary water-tank below the main tank, and maintains a circulation of water over the overflow weir.

From the outlets of the gas-pump and the combustion-air pump, piping leads the two streams of gas and primary air to the mixing chamber. From there the mixture of gas and primary air enters the burner, and meets the secondary air of the burner. The products of combustion pass out of the calorimeter after having given up their heat to a stream of cooling air whose direction of flow is counter to that of the combustion gases. These gases are cooled to within one or two degrees of the temperature of the entering cooling air. The cooling air passages are entirely separate from the gas-burner; and, to prevent heat losses, a polished double-walled tube is fitted around the burner jacket. This is in turn jacketed with the heated air.

Temperatures Measured by Electrical Thermometers.

The gas is consumed in a closed type of burner, which is entirely separate from the stream of cooling air. The incoming and outgoing temperatures of the cooling air are measured by a pair of electrical resistance thermometers. The rise in temperature is a measure of the heating value of the gas. The two resistance thermometers which form two legs of a Wheatstone bridge, with two fixed resistances serving as the other legs, are connected with the graphic recording instrument—a device which has been used so successfully with the Thomas meter. In this instrument the differences in temperature are translated into total B.Th.U. per cubic foot of gas. In other words it records the temperature rise based on the specific heat of the air; the number of B.Th.U. it takes to increase the air temperature being known. The B.Th.U. per cubic foot are recorded on a chart driven by a unique type of clock mechanism, which is reliable and accurate.

The Electric Motor.

The small electric motor ($\frac{1}{8}$ or $\frac{1}{10}$ H.P.), mounted on the tank casing, can be connected up to either alternating or direct current. It drives the meters and the direct-current generator for supplying the thermometers and the controlling circuits.

The Recorder.

We cannot do better than adopt the maker's description of the recorder, which, as already said, can be installed in any position and at any distance (as is most convenient to the user) from the calorimeter.

A slide wire resistance serves to balance the bridge, as indicated by a galvanometer needle. The position of the slide wire rider indicates the temperature difference between the two thermometers, and is calibrated in B.Th.U. The galvanometer needle is clamped at short intervals between contacts; and any deflection of the needle to right or left, indicating an unbalancing of the system, energizes either one of two solenoids which control the position of the slide-wire rider. The position of the slide-wire rider is recorded on the chart.

The clock regulating the chart-driving mechanism requires no winding, and will operate continuously as long as current is supplied to it. On the clock pendulum is mounted a glass-enclosed mercury switch of an extremely rugged type. The motion of the pendulum operates this switch in such a way that a power impulse is given to each swing of the pendulum, and the chart ratcheting solenoid is energized at the same instant. As the power for operating the solenoid is taken directly from the generator line, the timing of the pendulum is not affected by the work done by the solenoid. Being independent of spring tension, the clock gives accurate timing. The clock requires no attention beyond proper adjustment of the pendulum length. Duplicate recorders may be operated from the same calorimeter whenever desired.

The scale may be made to run from 300 to 600 B.Th.U., or the working arrangement can be designed within any narrow compass—say, 400 to 450 B.Th.U., or whatever is wanted. All that is required is just a simple change of the resistance and a new scale to correspond.

Modest Attention.

The operation of the calorimeter can be controlled entirely from the recorder. Once set up, the instrument will maintain its calibration accurately for long periods. The only attention required by either calorimeter unit is occasional oiling, replenishing of the water in the auxiliary tank, and a change of recorder charts once a month.

Good Design and Sound Principles.

The photograph shows the instrument as set up at Horseferry Road. Although this is only a temporary calorimeter hurriedly sent over for experimental and demonstration purposes, and some details will probably be modified, what was seen satisfies us as to the ingenuity of design and the soundness of the principles involved. Good workmanship is also a feature. But the fact that the average daily readings of two Boys calorimeters shows less than 1 p.ct. variation from the reading of the Thomas calorimeter chart, is the feature which particularly arrests attention, and will carry considerable weight of commendation.

ELECTRICITY SUPPLY MEMORANDA.

The maximum prices of electricity continue to ascend. The Electricity Commissioners know that concerns supplying current cannot live by charging below cost price; but where companies apply for power to increase their maximum charges, the local authorities, with the amiable intention of protecting the consumers—"protecting" is one of the most useful words in the vocabulary of a local body—ignore completely the rights of those who have found the money for conducting the private enterprise. But many electricity suppliers are still obtaining permission to advance their maximum prices. In two or three fortunate cases, prices have been reduced—for example, at Bedford, where the Council have decided to lower the charges for lighting from 10d., less 2½ p.ct., to 9½d., less ½d. per unit, and for power by ½d. per unit. But, generally speaking, the tendency is for the present high prices to be maintained, and even increased. Very properly, the low-priced units are receiving attention. There is in some places a great deal of extravagant talk regarding the low cost of generating the current for the purposes for which low prices per unit are charged. The competitive factor has more often greater weight than any other. The Islington Borough Council are among those who are increasing the lower priced units. They state that they are now reluctantly compelled to increase the charges for them as follows: For units at 1d. or under, a further increase of 30 p.ct., making 150 p ct. increase on pre-war prices; and for units above 1d., a further increase of 30 p.ct., making 100 p.ct. increase on pre-war prices. The Keighley Electricity Committee propose to advance the charges for energy supplied to the Tramway Department to a flat-rate of 1·75d. per unit. The present charge is 1·5d. per unit for the first 250,000 units and 1d. above this amount. At Watford the District Council have raised the charge for current supplied through slot meters from 5½d. to 8d. per unit.

The Lower Priced Units.

The Rateable Value System Again.

As seen, prices for electricity have gone up heavily, and in cases are not at the peak yet. In these circumstances, there is revival of the talk as to domestic tariffs, and the rateable value system once more comes to the surface—a system which has the tendency to cause the undertaking to do more work for a less average revenue per unit. There must be a time when such procedure would fall very hard on an undertaking. Assume such a large number of connections and use of current that generating and distributing plant had to be enlarged at current costs, would the average prices per unit realized then pay the concern? Mr. C. S. Davidson, of Barnes, has been writing on the subject of the rateable value system in the "Electrical Times;" and he seems to be well satisfied with it. From what he says in the article, it appears that some years ago the Barnes Council decided to adopt for domestic lighting (*a*) the contract tariff, (*b*) the rateable value tariff; and for domestic lighting and heating, the rateable value tariff. He points out that two things happen by the adoption of the rateable value tariff. The one is that the capital expenditure is reduced through the simplifying of the wiring arrangements and the reduction of the meters necessary where differential prices for various uses are in vogue. He regards it as financial folly to provide a large number of meters in such a district as Barnes, where a considerable number of the consumers are occupants of maisonettes, and prefer to prepay or "pay as they go" for light. Mr. Davidson calculates that to supply, lay, and connect the necessary service—cable, tee-box, cut-outs, &c.—for four maisonettes costs roughly £6; and if prepayment meters were installed merely to check the consumption and to accept payment, these would cost £26. Besides this, the revenue is small, and the cost of quarterly collections considerable. Most of the consumers in the better-class flats and villas appear to use some of the smaller domestic appliances, and so desire to avail themselves of the lower charge for heating. But this, of course, would mean expensive alterations and new wiring, as well as meters, and so the rateable value tariff was adopted. This, Mr. Davidson says, has encouraged increased consumption, and has magnified the load factor. The rates are—Lighting: 10 p.ct. per annum of the rateable value of the residence, and 1½d. per unit. Lighting and heating: 10 p.ct. per annum of the rateable value, with 1½d. per unit during the six winter months, and 1d. per unit during the six summer months. It is thought by the author that the rateable value tariff has justified itself.

Some Results of the System.

Mr. Davidson gave some typical examples of the results with lighting consumers. But we will only quote one case. In this the rateable value is £34. The previous annual consumption was 228 units, and at present 494 units. The fixed charge amounts to £3 8s., while the charge for electricity comes to £3 1s. 9d. The average price, adding together the fixed charge and the charge for electricity, works out to 3·1d. per unit. Mr. Davidson also gives some figures taken at random of houses where electricity is used for cooking and heating; and in these cases, amalgamating the fixed charge and the charge per unit, the average price for the current works out to figures ranging between 1·56d. and 2·5d. They illustrate (though this is not the intention)

the unfairness of the rateable value system. There is the case of a house, the rateable value of which is £155, and the fixed charge is £15 10s. The units consumed numbered 3326; and the average price per unit (including the fixed charge) works out to 2·5d. Another house, the rateable value of which is £47, pays only £4 14s. as a fixed charge, with the result that, though the consumption is approximately the same as in the case of the house of £155 rateable value (3538 units), the average charge is only 1·6d. —0·9d. less for every unit consumed. Is this fair? The article elicited a criticism from Mr. W. F. T. Pinkney. He takes the case referred to above, in which the previous annual consumption amounted to 228 units, and now to 494 units. Assuming, for the sake of argument, that the units were formerly paid for at the moderate price of 6d. per unit, the consumer would, the writer says, have paid £5 14 for his 228 units. On the rateable value tariff, the consumer has actually paid £6 9s. 11d. for 494 units; so that, if 6d. per unit was the rate for the previous annual consumption, he would only be paying an additional sum of 15s. 9d. for an extra 266 units. Clearly, therefore, the consumer must have been paying much less than 6d. per unit for his previous annual consumption, or else the tariff, Mr. Pinkney contends, is not satisfactory from the suppliers' point of view. It is quite clear that the advantage of the rateable value system is greater for the consumers' pocket than for that of the supply undertaking. We should like to see some figures for the rateable value system where the flat-rate charge is 10d. or 1s. per unit.

Electric Oven Criticism.

On two or three occasions we have referred to the paper that Dr. E. Griffiths and Mr. F. H. Schofield, of the National Physical Laboratory, read before the Institution of Electrical Engineers on the thermal characteristics of electric-ovens and hot-plates. The more this paper is talked about, the more it is apparent that the thermal characteristics are not of a very high order. In the discussion of the paper by the North Midland Centre of the Institution, there was a good deal of criticism of existing types of ovens. Mr. Allsop was one of the critics; and he told of experiences with one electric-oven which was loaded on the bottom side, and the elements were entirely out of sight. The oven was one which could be washed; and this was an advantage, as experience assures us that electric-ovens which cannot be cleansed, and so get a good coating of burnt fat on them, are smelly things. But the trouble was that the dispositions of the loading and the elements were wrong. Another oven in his experience had side heating. His wife objected to having to turn a loaf round six or seven times during the process of baking. This she did not have to do with a coal or gas heated oven; and it should not be necessary with an electric-oven. But Mr. Allsop has met with success by having a special oven built with the elements at an angle; and this has been at work baking bread daily for some seven years. But elements at an angle must cut into oven space. Another speaker—Mr. Hugh Gresley, of Doncaster—is of opinion that with electric cooking, there must be hot water, but electric water-heaters he describes as "very inefficient." In regard to ovens, he believes that the elements must be hidden away, so that the entire interior of an oven can be properly cleansed. An all-electric man in his house is Mr. Jepson, of Sheffield; but he thinks the slow adoption of electrical appliances is due to their first cost. It is the opinion of Mr. S. J. Jones that, until the electric-cooker can be used in the same rough-and-ready manner as the gas-cooker, it will not meet with much success. Although makers have been at work on electric-cookers for the past twenty years or more, it is clear they have not yet satisfied practical men either in respect of design or cost.

Gas-Rings and Radiant Energy.

It may be remembered that in the tests of Dr. Griffiths and Mr. Schofield, they found that electric hot-plates working with radiant heat were more efficient than other types. The point was noted by Prof. W. Cramp, when the paper was under discussion at a meeting of the South Midland Centre of the Institution of Electrical Engineers. One remark he made was suggestive; and it will perhaps be considered by our gas-stove makers. He said "The results had an interesting bearing upon similar apparatus heated by gas; for it would seem that gas-rings constructed upon the radiant energy principle would be more efficient for boiling purposes than those of ordinary type." We doubt it. There are some good gas-rings to-day (this does not apply to the badly designed ones) with which an efficiency of 60 p.ct. can be obtained; and Sir Dugald Clerk sees no reason why the efficiency should not ascend to 70 p.ct.

Business Conditions and Progress.

The electrical papers have lately been reporting upon the accounts and the proceedings at the meetings of the companies concerned in the supply of electricity to London. Upon the financial results the impressions have been deep that the higher costs of coal, rates, repairs, and labour have made. These are universal conditions in any industry. Of course, prices for current have increased. It could not be otherwise, despite all the economies which have been effected in generation by the introduction of improved plant. On the munitions load dropping immediately after the war, there were reductions of output. But since then, the restrictions on private consumption having been removed, there has been an increase in business, which has given more buoyancy to spirits, and a strengthened hopefulness regarding the future. New consumers are also being booked. There is the greater satisfaction over these features, seeing that they are coming about notwithstanding the higher charges. But there must be a fair allocation of the advance of business between the removal of the detracting artificial conditions which obstructed ordinary business and progress during and since war time, and the more normal conditions which are now arising. People have been doing lately what they could not do before; and so it would be imprudent to anticipate that the recent increase of business represents what may be taken will be normal progress. For example, in the residential districts, in order to help to compensate for present shortage in house accommodation, there has been a very considerable conversion of old houses into flats; and where one tenant formerly existed, there are now often found three or four, and some with families. This greater concentration is in one sense advantageous for business, though it means more capital expenditure for services and meters. All this is also strongly reflected in the commercial work of the gas companies for the past year. At two or three of the meetings of the electricity companies, there were references to the satisfactory increase in electric heating and cooking. "Electric cooking" includes egg-boilers and toasters, bacon warmers, and so forth. At the meeting of the St. James' and Pall Mall Electric Light Company, Mr. Walter Leaf made the bold assertion that, through generating economies, the Company are now in the position to compete directly with coal for heating and lighting. With lighting admittedly; but for heating, the applicable tests will not lend their confirmation. He also added that more rapid development of the domestic use of electricity for heating might be expected in the near future. All districts are not constituted the same as the St. James' and Pall Mall. The residents and their pockets are not the same in other areas; and so exceptional circumstances and experiences cannot be applied universally. While speaking of business developments, we notice these figures in the Notting Hill Electric Light Company's reports: Units generated and purchased, 4,358,489; sold, 3,035,553. The difference is 1,322,936, showing that about 30 p.ct. of the units generated and bought disappeared somewhere. A small part was doubtless used by the Company themselves; but what of the large remainder?

Dividends.

In the matter of dividends, circumstances have been kind to the stockholders in most of the electricity supply companies of London. Gas stockholders in recent years have been looking enviously at the differences in dividend, due to the facts that the electricity companies are governed not by the sliding-scale, but by relatively generous maximum prices. The ordinary dividends for the past year have ranged generally between 7 and 12 p.ct.; and the City of London Company have paid 12 p.ct., with a bonus of 2 p.ct. on account of the reduction of dividend in 1916. In two or three cases, compared with 1919, increased dividends have been paid.

Reorganization.

Naturally at all the meetings the subject of the reorganization of the electricity supply industry had outstanding attention paid to it. Among the companies, the administrations do not appear to be over-enamoured of what has been done. There are doubts as to whether the area defined by the Electricity Commissioners is in the best interests of London proper; and the difficulties of financing new schemes, especially where local authorities are concerned, are recognized as being highly embarrassing. The Government said: "Let us reorganize the electricity industry, and put it upon a new basis." They then got out something crude in the shape of principles on which the work should proceed. Now one by one the practical considerations keep unpleasantly popping up; and they constitute rather a formidable barricade to the fulfilment of the Government's first remarkable intentions, which had no real practical foundation. Among the electricity companies the view is gaining ground that the Electricity Supply Act of 1919, instead of being one which will bring about the development of the industry, will retard its progress. There is a reluctance to-day to spend capital with so much uncertainty ahead. And where there is a willingness to spend, the Electricity Commissioners have—they cannot help it, as it is part of their functions—to scrutinize very carefully the proposals, and hold them up altogether if they have the appearance of affecting any general scheme. There is a feeling, too, that the Electricity Supply Bill (No. 2), which is supplementary to the 1919 Act, will not be proceeded with this year. If so, the schemes proposed to which joint authorities and the Commissioners are now devoting attention will be further hung-up. Apparently the House of Commons thinks, whatever the notions that obtained in 1919, this is not the time for speculative schemes, involving very many millions of pounds and obligations of an unknown quantity; and it is impossible to gauge whether the productiveness of the joint schemes will be a *plus* or *minus* quantity compared with the developments which would otherwise be made along already existing lines.

The will has been proved of Mr. William Armitage Drake (of the firm of Drakes Ltd., of Halifax), who died last January; his property being valued for probate at £38,294. Mr. Emil Richard Groschke, of Billiter Buildings, E.C., sulphate of ammonia merchant, who died intestate, left estate of the gross value of £60,579, with net personalty £56,625.

SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.

A General Meeting of the Association was held last Thursday, at the Connaught Rooms, Great Queen Street, W.C. There was a good attendance. The proceedings commenced by the members lunching together, with the incoming President (Mr. J. Wesley Whimster, of Bath) in the chair. The Chairman of the Bath Gas Company unfortunately could not be present; but the Deputy-Chairman (Mr. S. Fox-Andrews) was there, and so was our old friend—the former Engineer of the Company, and now a Director—Mr. C. Stafford Ellery. The Secretary of the Company (Mr. W. Blundell) was also among the guests. The retiring President (Mr. Charles F. Botley, of Hastings) and the Hon. Secretary (Mr. W. H. Bennett, of Redhill) supported the President; and in honoured position, too, was placed an old member and friend of the Association, now retired from official activities, Mr. S. Y. Shoubridge. Most of the central bodies connected with the industry were officially represented.

After lunch, the toast of "The King" was honoured.

The Visitors.

Mr. Botley (the retiring President) proposed the toast of "The Visitors." He remarked that he was surrounded by gentlemen connected with the Bath Gas Company, and with various associated bodies. They were glad of the opportunity of seeing them. He welcomed very heartily on behalf of the members the representatives of the Company with which their President-Elect was connected. He could not help saying, because he felt it so strongly, that Bath was not only a beautiful city, but it had also a highly successful Gas Company. They had with them the Vice-Chairman of the Company, and Mr. Ellery, who was in large measure responsible for its prosperity. There was also the Secretary of the Company; and other gentlemen, including Mr. Shoubridge, who were well known to the members. He asked the members to join with him in drinking to the visitors and to the further success of the Bath Gas Company.

Confidence and Co-operation between Directors and Managers.

Mr. S. Fox-Andrews responded on behalf of the visitors and the Bath Gas Company. He said he was sure the members would have been more gratified if they had had the Chairman of the Bath Gas Company present to reply to this toast. However, he (the Deputy-Chairman) was proud to be there that afternoon for one or two reasons. First of all, he appreciated the value and the importance of the closest possible ties of confidence, even friendship, between gas directors and gas managers. He had journeyed 100 miles to be present; and if it had been 200 miles, he should have been there for that reason alone. He was sure the interests of the industry could be best represented and best carried on when there was perfect confidence and fair and free interchange of thought and action between directors and managers. This was an absolute necessity. Of course, gentlemen who were gas managers might regard the directors as not knowing very much about the technical part of their work; and he did not suppose they did. But he could hardly conceive of any managers who did not like to pour their troubles and their cares into the friendly ears of directors. Of trouble and care, he was sure they had had enough and to spare the last four or five years; and they were not by any means free of them yet. If they were able at such times to pour their troubles and cares into the ears of considerate chairmen, vice-chairmen, and directors, and to take counsel with them, there was some satisfaction in that. This spirit, he had an idea, was growing. Confidence in each other and co-operation were now found almost everywhere; and this was what was meant when directors and managers met together. Another matter of interest to him was that the members of the Association came to Bath for their new President. They did wisely. He knew Mr. Whimster better than any man in the room. He knew a good deal of his ability; and he congratulated the members upon having taken a gentleman as President this year who was thoroughly up-to-date, who was most energetic, and who never spared himself in the face of duty or difficulty. He might tell them that, during the last few years of stress and strain, Mr. Whimster had carried the Bath Gas Company through very successfully. They as a Company were pleased and proud that the members had selected the Company's Engineer to the presidential chair. He was sure his care, conduct, and ability would add dignity, if not lustre, to the office to which they had appointed him. He wished him a very happy year, and the Association a very prosperous one. There were great difficulties and problems before them, which association would help them to solve. But they had charge of one of the most interesting of industries. With regard to the June meeting, he was there that afternoon on behalf of the Directors of the Bath Gas Company to invite them to Bath. They wished all to come; for he could promise them an interesting time. [Applause.]

The President-Elect said he could not let this occasion pass without acknowledging the too flattering remarks of Mr. Fox-Andrews. But he knew his Deputy-Chairman; and he appreciated what he had said very much indeed. He (Mr. Whimster) was one of those fortunate people who had, as a Board of Directors, gentlemen who took a keen and lively interest in the industry. He thought all the members knew what it meant to have valuable support and sympathy from their directors. He could not wish for a better Board; and in the times of stress of the last few years, this had been a great help to him. He should also like to say how pleased he was to notice the hearty reception given to the invitation conveyed by the Deputy-Chairmau to visit Bath in the summer.

An Old Colleague on the Strenuous Times.

Mr. Ellery proposed the toast of the "Southern Association of Gas Engineers and Managers." He said it was a great pleasure to him to find himself again among the engineers forming the membership of the Association. He looked forward to the pleasure when Mr. Whimster invited him to come to the meeting that day. He had then only one thought—everything had to yield to being present. He had happy recollections of times gone by. He remembered the help he had received not only from the Southern Association, but from the individuals who formed the other Associations in the country. There was a time when each manager in his works liked to keep his secrets to himself. As things went on, this changed; and it was something for which all interested in the industry should be thankful that such Associations as these now met together, and imparted information that was for the general good. He looked round that day; and he missed faces that one was wont to look for at the meetings. Changes were taking place. But the Association was going on; and the influx of new blood gave them great hopes of what was lying before the gas industry in the days yet to come. Now that one had got out of the harness that had been worn for a long time, he could sympathize with the gas engineers of to-day in the strenuous times they were going through. Mr. Fox-Andrews had spoken of directors coming to meetings of this sort. They were no idle words when he said, as one who knew what they were going through to-day, that he wished all gas managers "God-speed" in the work they had to do. The difficulties were not over yet. They had gone through much. He only wished a representative from the board of each company could have been present, so that the directors might have realized better what the responsible heads of gas undertakings were going through. He felt these were days when officers of gas undertakings and boards of directors should do everything in their power to make it as easy as possible to carry on the undertakings they represented. There was another thing that was giving trouble. Mr. Whimster was considering a large outlay on the works. But everything seemed to be in such flux; and this made the difficulties greater. There were the questions as to what gas they were going to make; what plant they were going to adopt; what the quality of the gas was to be; and from what material they were going to make the gas. If ever the Southern Association needed to be in existence, it was to-day, in order that the best brains might be brought together to discuss, and to decide upon, what really was to be the future of the gas industry, to which they were all proud to belong. It was also a great pleasure to him to be there to do what little he could to support Mr. Whimster. He was delighted when he heard the members had elected him to be their President In Bath they had formed a high opinion of him. He had shown skill, and had kept the price of gas within reasonable limits. In proposing "Success to the Southern Association," he coupled with the toast the name of the President for 1921.

The President-Elect, replying on behalf of the Association, said he must thank those present for the way they had received the toast so ably proposed by Mr. Ellery. It was very appropriate that he should have submitted the toast, as he was a Past-President of the Association, and for many years was a very active member. Mr. Ellery knew the value of such Associations to-day, which value was even greater now than in past years. In these times, many important questions cropped-up almost every day; and it was good to meet together to discuss them. He had also to thank Mr. Ellery very sincerely for the remarks he had made with reference to him (Mr. Whimster). The members flattered themselves that their organization had done useful work in the past. He hoped his year of office would not fail to carry on this good work; and he could assure all present that he would do everything in his power to uphold the best traditions of the Association.

THE BUSINESS MEETING.

The Business Meeting was held shortly afterwards. The retiring President (Mr. C. F. Botley, of Hastings) occupied the chair during the transaction of the first part of the programme.

Confirmation of Minutes.

On the proposition of the President, it was agreed to take as read the minutes of the last meeting, as published in the report in the "Journal."

Annual Report.

The President proposed, and Mr. A. H. Andrews seconded, that the annual report of the General Committee be taken as read, and this was agreed to.

Among the items in the report were the following:

The General Committee feels that the Association has experienced a year of exceptional activity and progress, and a survey of the work accomplished must bring to the members a pleasurable realization of its increasing usefulness. The number of new members recorded later in the report bears eminent testimony to this fact, and also to the success attending the re-organization of the Association.

The Association, in common with others, has grappled with many difficulties during recent years; but the year now under brief review has aptly been designated a "red letter" one for the industry, inasmuch as it witnessed the advent of a new Charter (the Gas Regulation Act), to which the Royal Assent was given on Aug. 4. The Act by no means dissipates all trouble; but it provides opportunity and measures of relief, which establish confidence in the future of the industry. The Association recognizes with gratitude the fine work of the National

Gas Council in this matter, under the President, Mr. D. Milne Watson, to whom special credit is due.

[Then succeeded a review of the proceedings of the year; and the report ended as follows:]

Substantial progress in membership has been made during the year; 38 names having been added to the roll.

The Committee deeply regret having to record the death of the following members: Mr. W. Bugby, of Brentford, and Mr. J. T. Jolliffe, of Ipswich.

There have been 13 resignations and 5 names were removed from the list by the Committee. This leaves a total of 259 members, as compared with 241 at the end of 1919.

The receipts totalled to £251 8s. 10d., while the expenditure amounted to £279 17s. 1d.—showing a deficit of £28 8s. 3d. Considerable extra expenditure, however, necessitated during the year in connection with the organization of the district meetings, is not expected to recur. The amount standing to the credit of the Association at the end of the year was £15 2s. 8d.

First Annual Report of the Committee of the Eastern District.

The period under review is of unusual interest, because the old Commercial Section, as such, has ceased to be; and under the new constitution the district meetings of the Association have been open to the consideration and discussion of technical as well as commercial points.

There have been fifteen meetings; and, from the attendance of members, the acquisition of new members, and the discussions at the meetings, it is fair to assume that the new arrangement has proved successful. The average attendance was 35. The President (Mr. C. F. Botley) was generally able to take the chair, but in his absence Mr. L. Trewby officiated.

[A list of more important subjects discussed was given.]

It has to be announced with regret that Mr. R. Seymour Tobey, of Horley, who for over eleven years has acted as Honorary Secretary, has found it necessary to resign as from March 31. His services have been greatly appreciated by the members of the Eastern District. Mr. Lawrice Trewby, of Mill Hill, has been elected Honorary Secretary in his stead.

First Annual Report of the Committee of the Western District.

Twelve district monthly meetings were held during the year—six at Exeter, and one each at Bath, Bridgwater, Plymouth, Taunton, Torquay, and Weston-super-Mare. The average number of members attending these meetings was sixteen.

The subjects discussed were mentioned.

It is generally recognized that most useful information has been obtained as the result of the discussions. The Gas Regulation Act was under review on many occasions; and valuable particulars were made available by those who have already made applications to the Board of Trade under section 1.

The interest shown at these meetings proves the wisdom of forming a Western District of the Association; the scattered nature of the area often precluding members from attending meetings held at towns remote from their own.

Election of Mr. James W. Helps as an Honorary Member.

The President proposed that their old friend Mr. James W. Helps be elected to the honorary membership of the Association. He remarked that most of the members like himself had the privilege of knowing Mr. Helps, who was unfortunately not able to be with them that day. He was sure they all realized what Mr. Helps did for the Association, and what he had done for the gas industry, and they all knew him personally. They would therefore be pleased to know he had accepted an invitation to become an honorary member of the Association. It would be a pleasure to them all to elect Mr. Helps to the honorary membership.

Mr. W. E. Price (Hampton Wick) said nothing could give him greater pleasure than to second the proposition. To those of the members who knew Mr. Helps (and most of them remembered him well), nobody could have suggested a name more suitable for hon. membership than that of their old and esteemed friend. He did a lot of good work, over many long years, for the Association and for the gas industry generally. But unfortunately he was laid aside; and they all sympathized with him most heartily. Though he might not be with them that day, he was with them in spirit. They could do nothing less than show him their respect by electing him an hon. member of the Association in connection with which he had done so much.

The President said he wished to read a telegram that had just been received from Mr. D. Irving, one of the Past-Presidents of the Association. It was as follows: "Regret inability to be with you as intended. Wish successful meeting. Most heartily support conferring hon. membership on James Helps, my old and esteemed friend of over thirty years' standing."

The motion was carried with great enthusiasm.

New Members.

The Hon. Secretary (Mr. W. H. Bennett, of Redhill) read the list of the names of new members. It was as follows:

Mr. T. H. Beaumont, of Horley; Mr. Bernard P. Bezant, of Dartford; Mr. C. J. Dickinson Gair, of the South Metropolitan Gas Company, Vauxhall; Mr. Thomas Hardie, of the Gas Light and Coke Company, Horseferry Road, Westminster; Mr. R. W. Hunter, of Beckton; Mr. George Richmond, of Beckton; Mr. Ernest Scears, of Redhill; Mr. E. F. Smallbone, of Broadstairs; Mr. C. Stapleton, of Tavistock; and Mr. T. H. Woodcock, of Stroud, Glos.

The President said he was sure the members would be pleased to have such a long list of new members again on this occasion. It showed how rapidly the Association was growing. The names had all been before the Committee, and had been passed. He had great pleasure in formally moving that the gentlemen named be elected.

Mr. L. J. Langford (Tunbridge Wells) seconded the proposal, remarking that he felt sure the new members would be a great acquisition to the Association.

Representative on the Council of the Institution.

Mr. D. H. Helps (Reading) said, as one who was born in Bath, whose father was fifty years Secretary of the Gas Company there, and who remembered quite well the days that Mr. Ellery went there as Engineer (he believed it was in the year 1880), he had much pleasure in proposing that Mr. Whimster, their new President, be the representative of the Association on the Council of the Institution of Gas Engineers. He (Mr. Helps) was fortunate in the past in having Mr. Whimster as an assistant; and he knew of his great value. Above all things he was an engineer, and a very fine engineer. What he did not know about gas management was not worth knowing. He knew of no man more capable of getting at the truth of any matter that arose, because, coupled with his very fine training and knowledge of the whole job, he was one of those who never minded going to others to discuss any questions on which there was any doubt. In these days they could not afford to run and play entirely off their own bats.

Mr. J. Taylor (Weston-super-Mare) said he had much pleasure in seconding the motion, and particularly was he pleased because, speaking on behalf of the members of the South-West District, this was a nomination of one of themselves as a representative on the Council of the Institution. They well knew in the South-West the great value of Mr. Whimster's work, and his keen attention to every matter of detail connected with the industry. They were quite sure that the affairs of the Association would be in very safe hands, and that Mr. Whimster would be an extremely valuable member of the Council of the Institution.

The motion was heartily carried.

The President-Elect, in reply, thanked the members very much indeed for electing him as their representative on the Council of the Institution. He greatly appreciated the way that Mr. Helps had put forward the proposal. Mr. Helps was his first chief; and anything he could claim that day he must put down to his early training. It was a number of years now since he was under Mr. Helps, and those were very happy times indeed for him. He was also pleased to see present his late chief, Mr. Shoubridge, to whom he was also indebted for a great deal. It was a pleasure to him to know Mr. Shoubridge was made an hon. member of the Association at the last meeting, as he was a man who had done a great deal for the gas industry, although not perhaps so much in the limelight as many others were. He could assure the members that anything he could do on the Council of the Institution to further the interests of the Association and of the gas industry generally, he should be very pleased to do.

The New and the Past Presidents.

The President said he had now the most important duty to perform that fell to him at this meeting. After all the very proper and very true things that had been said regarding Mr. Whimster, there were no adjectives left for him to use. [Laughter.] At the same time, Mr. Whimster knew, although he had been very diffident in taking the office of President—not perhaps from want of confidence in himself, but from the very natural feeling that he did not want to take his turn before others—that he (the President) and others had urged him to take his turn as it cropped up; and he had perfect confidence that he would not let the Association down. On the contrary, he was sure he would add lustre to it, and would carry it on further abead in the ensuing year. He had great pleasure in asking Mr. Whimster to take up the office of President; and, in doing so, he wished him every success, and offered his own full allegiance to him.

The President, on taking the chair, was received with great applause. He said he had first to thank Mr. Botley for the very kind words he had spoken, and the members for the hearty way in which they had welcomed him. His first duty in the chair was a very pleasurable one, and that was to propose a hearty vote of thanks to the retiring President. Mr. Botley had occupied the chair in a manner which was only to be expected from the bearer of a name so long and so honourably connected with the gas industry. They, the members, were indebted to him for so worthily maintaining the traditions and prestige of the Association. They had had in him a President who had not spared himself. He had always been willing to do everything he possibly could in the interests of the industry. Although he (Mr. Whimster) was unfortunately prevented from being present, he understood that the members had an extremely pleasant and profitable day on their visit to Hastings last summer. On this visit, there was ample confidence that Mr. Botley was not only an ideal President, but was also a capable and efficient administrator of a gas undertaking. He was sure they would be quite unanimous in accord-

ing him their heartiest thanks for the way he had presided over their deliberations during the past year.

The motion was cordially passed.

Mr. Botley, in reply, said that now he was on the retired list he was not going to detain the members by any lengthy remarks. Having had the opportunity on several occasions of expressing his great indebtedness to them both for the honour they did him in electing him to the office of President, and for the way they had supported him in his year of office, there was very little more to say. He was extremely obliged to the President for what he had said, but was very sorry he was not able to visit Hastings last summer. He (Mr. Whimster) might rest assured that, if at all possible, he (Mr. Botley) would be at Bath in June. It simply remained to him to express his thanks to the members, and his earnest hope that he had not altogether failed in continuing those traditions that had been upheld in the past by so many worthy men. He also wished to express his obligations to the Committee, to their Hon. Secretary (Mr. Bennett), to Mr. Trewby, and to any others who had during the year rendered it possible for him to carry on with the success that the members deemed he had made of it.

The President then delivered the following

INAUGURAL ADDRESS.

Gentlemen,—My first duty as your President is to thank you for the honour conferred upon me by electing me to the chair. When I call to mind the few years I have been a member of the Association, I highly appreciate the compliment. I accepted the position knowing full well there are others more able than myself to occupy the chair; but as I consider it the duty of each member to accept any office that his fellows wish him to fill, I could not consistently decline. I trust to receive the hearty co-operation of every member during my term of office in an endeavour to maintain the work of the Association at the high standard to which it has been brought under my predecessors.

THE LATE LORD MOULTON.

I feel it incumbent upon me, before passing on to consider the present state of the industry generally and the interests of the Southern District Association in particular, to refer briefly to the great loss—a really national loss—which we have suffered in the recent death of Lord Moulton. The value of his work to the nation during the war as head of the Explosives Department of the Ministry of Munitions cannot be estimated. The gas industry found him quick to recognize, and generous in his publicly expressed admiration of, the essential war work it accomplished. It is perhaps not inappropriate that it should fall to my lot to utter this expression of appreciation and regret—which I am sure you all share to the full—since Lord Moulton's connection with the city of Bath was by no means negligible. The son of a Wesleyan minister, his education began at Kingswood School, Bath; and his frequent visits to his *alma mater* for special functions were an inspiration to the students there. The name has long been illustrious throughout the world of literature; but it remained for Lord Moulton to make it famous in the realms of Law and Science. His presidency conferred honour upon the Institution of Gas Engineers; and I am sure you will all desire to pay silent tribute to the memory of a great man, a noble character, and a sincere friend to the gas industry.

THE GAS REGULATION ACT.

Events crowd upon us so rapidly that each year seems to bring with it some outstanding feature. There is no doubt that 1920 will become a special landmark in the history of the industry by reason of the passing into law of the Gas Regulation Act. It is hoped that the Act will be the means of re-establishing the industry on a sound basis financially. It grants freedom by allowing each undertaking to supply the quality of the gas it can produce most economically and best adapted to special local conditions. It is impossible to-day to say what all the advantages of this freedom will be; but there is no doubt whatever that it will be of benefit to consumer and producer alike. It is earnestly hoped that the findings of the Committees appointed by the Board of Trade to inquire into the limitation of inerts and carbon monoxide will be favourable to the industry; and the unanimous opinion seems to be that complete freedom should be granted and no limitations at all imposed. In deciding on a calorific standard, each undertaking will have to consider very carefully its local and other conditions. The cost of coal and the prices obtainable for residual products, especially coke, also the method of manufacture in operation, will be the potential factors in the settlement of this point.

ECONOMY.

This is an extremely popular gospel at the present time, as a precept. Unhappily, however, it has more exponents than exemplars; more preachers than disciples. Example is so much better than precept that it behoves the industry to seek and secure it with all the vigour with which it is capable. There certainly can be no complaint in our case on the ground of lack of scope for economy. There is a large field for economy in fuel in the heating of our retort-settings, in the generation of water gas, and in steam-raising. Waste-heat boilers have been in operation in America for some years, but are new to British practice. It is hoped that those engineers who have installed them will give us the benefit of their experience. If these boilers prove to be as successful as anticipated, the cost of manufacturing water gas will be very materially reduced. In the past, owing to the abundant supply of breeze, which was practically unsaleable, little or no effort was made to obtain the best results from its use, or to economize in the employment of the steam generated. There is no doubt whatever that, by careful attention to boilers and piping, very substantial economies can be effected.

For certain processes in our works, such as the manufacture of sulphate of ammonia and water gas, steam is essential; but as a motive power—owing to the scattered nature of the power-using units in gas-works, necessitating long lengths of piping and consequent condensation—it is very wasteful. Most gas-works to-day are equipped with electrical generating plant for the supply of current to stoking machinery; and a more general adoption of this form of motive power would be an advantage.

With present high rates of wages, there is urgent need for the strictest economy combined with efficiency in labour; and wherever practicable machinery should be installed to take the place of unremunerative manual work. It is equally important, however, to ensure that such installation is a real economy, as unless machinery is almost continuously employed there is a danger of any saving effected being swallowed up by interest, depreciation, and repair charges on plant. One sometimes sees machinery employed wastefully on work of a more or less spasmodic nature. One instance of this is elaborate plant for handling oxide in connection with purifiers.

COAL.

This is a subject of the first importance to us, and at the time of preparing these notes, it is impossible to foresee what the future has in store. The negotiations between the colliery owners and the miners have failed to result in a settlement; and a strike has now been declared. The position is all the more serious in view of the fact that the Miners' Federation have decided to withdraw all labour from the pits, including the pumpmen and enginemen. This will cause considerable delay in restarting when a settlement is arrived at, and will inflict permanent injury on many mines. It is evident that the Miners' Federation are attempting to force the Government into continuing the subsidy; and it is earnestly hoped that the Government will not give way.

A coal strike is always disastrous for the country generally, and particularly so for our industry. Fortunately, most gas-works have sufficient coal to enable them to carry on for some considerable time, as during the past few months supplies have been plentiful, and undertakings have availed themselves of the opportunity of replenishing their stocks. Being no longer compelled to accept coal unsuitable for gas making, they have in many cases obtained their supplies from pre-war sources. Unfortunately, the general quality of the coal is still very far below pre-war standard—little or practically no attempts having been made to reduce the amount of inert material. The bulk of the coal we use in Bath comes from the Somerset coalfield; and the following table shows how little improvement there has been in the post-war quality of the coal.

Somerset Coals—Percentage of Ash.

—	Pre-War.	During War.	Present Time.
	P.Ct.	P.Ct.	P.Ct.
1	13·5	19·9	17·4
2	11·8	22·6	21·5
3	15·0	30·2	25·6
4	7·8	18·3	18·5
5	13·0	21·0	20·3
6	9·5	14·5	12·3
7	13·6	27·8	24·1
8	12·0	31·2	26·3
9	12·6	25·0	17·0
10	10·3	16·0	14·6
11	11·3	18·5	17·3
Average	11·9	22 3	19·5

RESIDUALS.

The high prices ruling for coke and other residuals last year counterbalanced to a great extent the increases in coal, wages, and materials; but the present slump in the coke, sulphate, and tar markets will make it very difficult for gas undertakings to avoid increasing the price of gas, unless there is a corresponding reduction in expenditure.

Coke.—The coke market to-day is in a very serious condition, and a vigorous campaign must be organized to stimulate the demand for, and to popularize the use of, this fuel for industrial and domestic purposes. We all recognize the great success which has attended the valuable work of the "B.C.G.A." in increasing gas sales. It seems to me, however, that the time has come when we should have a Coke Association, carrying on propaganda work throughout the country in connection with this residual, and reinforcing the work done locally by the various gas undertakings. The "B.C.G.A." have already done very useful work in preparing advertising literature, and have also suggested a one week's selling campaign throughout the country which would no doubt have good results; but I am convinced that, if we are to obtain a permanent demand for coke, a more regular and systematic scheme is necessary. Those undertakings which are

in the happy position of having a ready market in their district for the whole of the coke produced by them could materially assist by enlarging the sphere of their vision beyond their own coke heap, canvassing their district to its fullest extent, and buying coke from less fortunately placed undertakings for re-sale. To the pleasurable knowledge of having done a neighbourly turn, there might also be added the more solid satisfaction of an increased revenue.

Sulphate of Ammonia.—The present state of the sulphate of ammonia market is most disquieting. Members of the British Sulphate of Ammonia Federation are fully aware of the position; and I think the matter can be safely left in the hands of the Executive.

Tar.—During the past few months there has been a serious fall in the values of tar and tar-products; but, fortunately, there is still a good demand for dehydrated tar for road purposes. Care, however, must be taken to see that the prices charged for the latter are not made prohibitive, as this would have the effect of discouraging the use of tar for this work and of opening the door for competing substitutes. For many years past gas undertakings have been more or less in the hands of the distillers as regards prices obtained for their crude tar, and, as a remedy, several co-operative tar schemes between producers and distillers have been brought forward in various parts of the country—the latest being that formed in the Bristol area. These schemes should be of benefit to the gas undertakings concerned, and result in fair values being obtained for their products.

MANUFACTURING PLANT.

Most of us to-day are considering extensions to our manufacturing plant. Our war experience has taught us that it is possible to under-estimate its capacity; and it behoves us to see if, even now, we are working it with the utmost efficiency and obtaining maximum results before embarking on extensions. Moreover, it may be possible at a comparatively small expenditure to modernize existing plant and considerably increase its output. For instance, where there is an opportunity of re-modelling horizontals by increasing the number and size of the retorts in the settings, I am strongly of opinion that, having regard to the great saving in capital outlay under present conditions, this is the soundest proposition. If, however, it is necessary to erect new plant, a choice will have to be made between the many systems now in vogue—from straight coal gas to total gasification; and there never has been a time when it has been more difficult to arrive at a decision on the most economical and efficient system to adopt. Many points will have to be considered. The main object is the production and distribution of heat units at the lowest possible cost per therm. Cost and suitability of the coal available, and the price obtainable for residual products, will be all-important factors in arriving at a decision.

The fashion to-day seems to be in favour of verticals. There are, however, still strong advocates of horizontals; and there are many works where the latter are in use giving results which bear very favourable comparison with the former. Up to the present I am still old-fashioned enough to pin my faith to horizontals. One of the chief points urged in favour of verticals has been the low labour costs; but I venture to think that, compared with up-to-date horizontals carbonizing large charges, there is little to choose between the two systems. The cost of repairs, however, and freedom in the choice of coal, appear to be in favour of horizontals.

There is still room for improvement in the design of horizontal settings, especially in the construction of the producers. Producers should be designed to give a constant depth of fuel; thus ensuring a regular supply of producer gas. This would result in a considerable saving of fuel. The position of the producer in most horizontal settings makes the process of feeding it one of the most arduous operations of retort-house work; whereas, by careful designing, this work could be almost eliminated.

CARBONIZING PLANT AT BATH.

Our carbonizing plant at Bath is entirely on the horizontal system, consisting of 31 settings of eights, 22 in. by 16 in. by 20 ft. long. The charging and discharging of the retorts are carried out by Fiddes-Aldridge simultaneous stoking machines, of which there are two—one acting as a stand-by in case of breakdown. The maximum amount of work done by one machine has been about 200 charges per 8-hour shift. The coal is fed to the machine from two spot hoppers. These machines do very good work; the only serious drawback being their inability to put a full charge in the retorts. The charges average about 9 cwt. in our case; and this, of course, necessitates 8-hour work. The makers have recently made experiments at our works with a new type of chain. This chain has proved so successful that we are having one fitted to one of our machines; the makers guaranteeing a charge of 13½ cwt. This will mean a considerable saving in labour and improvement in results. The chain is of entirely new design, consisting of a central bar having push-plates on either side, instead of the usual channel bar with centrally-hung push plates. It is hoped the machine will be completed in time for members to see it in operation when they visit Bath.

The coke is removed from the retort-houses by De Brouwer conveyors, and passes over screens into overhead hoppers. The conveyors work very satisfactorily; and although the general opinion expressed is that wear and tear is excessive, this has not been our experience. The cost of repairs can, with ordinary care and supervision, be kept quite moderate. Our practice is to inspect the chains, when running, twice daily; and any defects found, such as worn links or rivets, are immediately remedied. One of the peculiarities of these chains is the uneven stretching; the side furthest from the bench stretching more than the other. To overcome this difficulty, we periodically turn the chain over completely, and when the other side (which is then furthest from the bench) becomes the longer, we repeat the operation. This ensures the chain wearing evenly throughout its life. Naturally, owing to the lengthening of the chain, it is necessary to alter from time to time the pitch diameter of the sprocket wheels; and this is done by having three different sets of interchangeable teeth. By adopting this system of careful inspection and maintenance our chains last on an average four to five years. There is no doubt that for smooth working in the retort-house, and saving of labour, this type of conveyor gives excellent results.

[The President, in an aside, said the chains were originally put in to deal with 6-cwt. charges—one chain on each side of the bench. The chains now dealt with 9-cwt. charges, all on one side; and there would, he thought, be no difficulty in dealing with 13½-cwt. charges. The total length of the chain, centre to centre, was 325 feet; and the width 19⅝ in. centres.]

The coal is brought into the retort-houses in railway wagons at stage level, and unloaded by hand into the crushers. Our present carbonizing costs, including unloading coal, are 3s. 3d. per ton of coal carbonized. This includes foremen, machinemen, stokers, firemen, men attending tar towers, settings, cleaning flues and scurfing, conveyor enginemen (who also load railway wagons with coke from hoppers), mechanics attending running repairs of machines, elevators, and conveyors—in other words, all labour in the retort-house but not including power-house men, exhauster men, or boiler men.

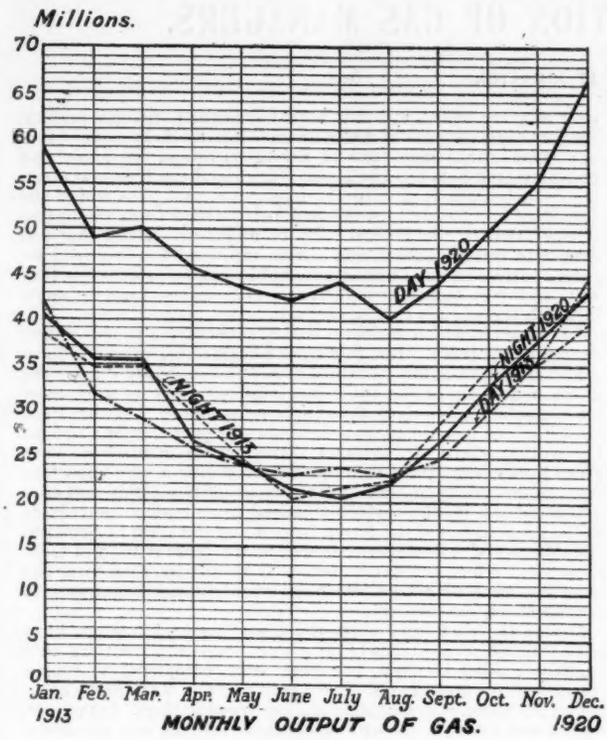
While on the subject of carbonization, I may say that, owing to the very high ash content of the Somerset coal, we experienced considerable trouble early in the war with clinker in our furnaces. At times it was necessary to clinker the fires every four hours. The work was very laborious, and the removal of the clinker caused considerable damage to the furnace linings. In 1915 we experimented with several of the furnaces, trying different types of fire-bars to overcome the difficulty. Eventually we found that, by fixing the fire-bars in an almost perpendicular position, instead of horizontally, we completely overcame the trouble. The fires now only require pricking-up about four times each shift; and once per shift a small quantity of the bottom of the fire is raked out from below the bars. Since this method was adopted there has never been any occasion to remove the bars, as practically no clinker is formed. Some of the furnaces which were let-down after working for two years were found in excellent condition; the sides being almost untouched (only a few blocks being required) and the backs as good as the day they were put in. Our previous practice had been to reline the furnaces completely every year, so that the saving in repairs is considerable. There is also the saving in false bars, clinkering tools, and labour. In addition, there has been marked economy in fuel, due to the more regular production of producer gas.

There are one or two other methods which we have adopted in our retort-house working which may be of interest—one being the use of water instead of liquor in the hydraulic mains. From tests made it was found that the strength of the liquor running from the tar towers was practically the same when using water as when using liquor. This obviates the necessity of overhead liquor tanks in the retort-house, with consequent losses of ammonia. Another feature is in connection with the tar run-offs from our hydraulic mains. It is generally considered necessary for these to be not less than 4 in. diameter; and a great many engineers favour even larger sizes. Personally, I have never been able to see the reason for having such large pipes, and when installing tar-towers some five years ago I decided to fit the hydraulics with 3-in. and 2-in. diameter outlets. Although some of these mains are about 50 ft. long, and have only 2 in. fall in 10 ft., we have never had the slightest trouble with stoppages. This I attribute to the fact that, with the small diameter pipe, the tar is kept constantly on the move.

DISTRIBUTION.

The last six years have proved a heavy tax on most of our distributing systems, owing to the increased demand for gas, and our inability to carry-out the necessary extensions of our mains. The reconstruction and enlargement of trunk and service mains is almost prohibitive at present-day prices, and the most economical method of augmenting the supply would appear to be by a system of high-pressure mains feeding the low-pressure mains at various points. To meet the greater demand most of us have found it necessary largely to increase the initial pressure at the works in order to maintain a sufficient supply at the outskirts of the district. This, however, is not satisfactory, as consumers near the works get widely varying pressures. I venture to think the time is not far distant when every service will be fitted with a governor, thus ensuring constant and even pressure to all consumers.

In Bath last year the output increased by 30·72 p.ct. over 1913. Table A shows the increases per month; and it will be seen that the greatest increase took place during the summer months. From some figures I have tabulated, I find that the whole of the increase has been on the day consumption between the hours of 2 a.m. and 6 p.m., the increase between these hours being 65·2 p.ct.; whereas between 6 p.m. and 6 a.m. there has been a



decrease of 2 p.ct. These figures are very striking, and clearly show the growing popularity of gas as a fuel.

From the diagram showing the monthly day and night output, it will be noticed how very little change there has been in the night output month by month in the two years—the two lines being almost identical. It is also interesting to note that, whereas the night output in 1913 exceeded the day output (the figures being 51·26 and 48·74 p.ct. respectively), in 1920 the day output far exceeded the night output—the figures being 61·58 and 38·42 p.ct.

Bath being essentially a residential city, we have very few industrial consumers; yet our average consumption per consumer compares very favourably with other towns. The figures per consumer for the year 1920 are as follows: Ordinary, 61,214 c.ft.; slot, 26,554 c.ft.; average, 45,774 c.ft. But even now we are far from the point of saturation.

From a recent census taken of 63 nine-roomed houses, the average consumption was 59,000 c.ft. per annum; the maximum being 178,000 c.ft. and the minimum 13,000 c.ft. It is evident from these figures that there is plenty of scope for increasing the average consumption per consumer.

TABLE A.—*Showing Increase in Output in* 1920 *over* 1913.

	Increase in Output. P.Ct.
January	21·74
February	22·00 (corrected for extra day)
March	31·91
April	29·47
May	37·89
June	38·82
July	37·36
August	36·28
September	32·26
October	27·47
November	32·06
December	26·65
Average for Year	30·72

TABLE B.—*Monthly Day and Night Output of Gas from Works.*

	1913.		1920.	
	6 a.m. to 6 p.m. Day.	6 p.m. to 6 am. Night.	6 a.m. to 6 p.m. Day.	6 p.m. to 6 a.m. Night.
	P.Ct.	P.Ct.	P.Ct.	P.Ct.
January	51·9	48·1	59·2	40·8
February	47·7	52·3	57·8	42·2
March	45·3	54·7	58·4	41·6
April	46·5	53·5	63·0	37·0
May	49·2	50·8	64·5	35·5
June	53·2	46·8	66·4	33·6
July	52·7	47·3	68·4	31·6
August	50·1	49·9	64·3	35·7
September	46·6	53·4	62·3	37·7
October	46·1	53·9	60·1	39·9
November	50·5	49·5	59·2	40·8
December	52·7	47·3	60·5	39·5
Average	48·74	51·26	61·58	38·42

HOUSING.

There are very few towns throughout the country where there have not been activities during the past twelve months in connection with housing schemes, and most of us have been faced with the problem of agreeing with the housing authorities terms on which gas should be supplied and houses fitted up. While all of us are keen on seeing that gas is used exclusively in these houses, yet it is absolutely necessary, in view of the present high costs of installation, that this work should only be undertaken on a profitable basis. Unfortunately, some undertakings have adopted the principle of installing gas at any price, and have supplied the internal fittings, mains, and services almost free of cost. Actions of this kind make it very difficult indeed for others to obtain fair payment towards the expenditure; and if gas undertakings do not receive payment for the bulk of the expenditure, it will be much better for them to refuse the business.

In Bath, the local authority own the electricity undertaking; and there was a strong vote in favour of electricity for lighting. I am pleased to say, however, that the Council wisely decided on gas throughout. The houses are being fitted up with slot meters—a cooker only being supplied free. The Housing Authorities pay for the complete piping and fitting-up of the houses with a geyser, wash boiler, and eight lighting points, including pendants, brackets, and inverted burners complete. No gas-fires are installed; but supplies are run to three of the fireplaces. We are carrying-out the whole of the work, and are paid £28 19s. 6d. per house. As regards mains and services, we submitted an offer to the Council which works out at approximately £14 1s. 6d. per house; and this has been accepted by the Council, subject to confirmation by the Ministry of Health.

THE NEW CONSTITUTION OF THE ASSOCIATION.

Before closing, I would like to say a word about the alteration in the constitution of our Association. "The old order changeth yielding place to new;" and now that the reconstruction of the Association has been in operation for twelve months, it is possible to speak with practical experience of the change. Speaking as Chairman of the Western Section, I can confidently claim that it has been of the utmost advantage, and has been greatly appreciated by the members of our section. There have been valuable discussions on both technical and commercial subjects; and the excellent attendance at our meetings has been convincing proof that their importance is generally recognized. The enhanced usefulness of the Association under its new constitution is the best justification for the change.

At the close of the address,

Mr. S. Y. SHOUBRIDGE, as an old colleague of their President, said it gave him the greatest possible pleasure to move a hearty vote of thanks to him for his most instructive and suggestive address. If there were any doubts at all in the mind of anyone as to Mr. Whimster's fitness to occupy the position in which they had placed him, they would have been dispelled by the address to which they had listened with such great pleasure. Mr. Whimster had gone over the whole field of gas politics of the moment, and had given them information with regard to his practices at Bath which would be very useful to them all. They knew from what the Deputy-Chairman of the Company had said that day how highly the Directors valued Mr. Whimster's services; and they knew from the printed information about the working of the Company with what great success he had handled its affairs since he had been the Engineer. It afforded him (Mr. Shoubridge) great pleasure indeed to see him in the chair, because he had always felt that Mr. Whimster would distinguish himself in his career. He was therefore delighted to know that their President had succeeded in gaining the approval of the members who had placed him in the high position he now occupied. He wished him every success during his year of office; and he was certain that he would add to the usefulness of the Association, and would hand it over to his successor increased in value and power in every possible way.

Mr. FRANK LIVESEY (Maidstone) said he was very glad indeed to second the resolution. The last time he had the privilege of seconding a vote of thanks to a President for his address was in 1910, when he seconded the vote of thanks to Mr. Ellery for the valuable address he then gave the members. In the present address, they keenly appreciated that, having gone to the mild air of Bath, Mr. Whimster was able to look upon gas politics in the same manner as Mr. Ellery did, with careful and serene contemplation; and he had not allowed the passing from east to west—from the one extreme to the other—to affect his judgment as a gas engineer. Although, for example, they had had put before them by able exponents the many virtues of vertical retorts, Mr. Whimster had come before them boldly that day, and had stated the advantages of the horizontal system. This would be of great assistance to them all. Indeed, all his remarks would be very valuable to them, and so he associated himself most heartily with the vote proposed by Mr. Shoubridge.

The motion was heartily passed.

The PRESIDENT said he had to thank the mover and seconder for their kind words, and the members for the way the resolution had been received. He did not deserve it. Personally, he was disappointed with what he had done; but if there had been anything in the address which had been of interest to the members, he had been amply repaid for preparing it.

This concluded the proceedings.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

SPRING MEETING AT JOHNSTONE.

The Spring Meeting of the North British Association of Gas Managers was held on Friday last, at Johnstone. Ideal weather favoured the gathering, and despite the limitation of the train service, consequent upon the industrial crisis, the meeting was favoured with an attendance which well-nigh constituted a record. Prior to the meeting many of the members availed themselves of a cordial invitation extended by the Provost, Magistrates, and Town Council to visit the Corporation gas-works at Johnstone, of which the President for the time being (Mr. James Dickson) is in charge. Mr. Dickson himself welcomed the members, and conducted them over the works. In the course of the visit the following statistical details were furnished showing the capacity of the various units of plant associated with the undertaking:

Johnstone Corporation Gas-Works.—Capacity of the Various Units of Plant.

The retort-bench is capable of a daily output of 850,000 c.ft. for the full bench. The coal-storage hoppers are equal to 48 hours' supply. There are two hydraulic pumps—one 10 ft. by 2 in. by 8 in., and one 7 in. by 1⅛ in. by 6 in. Electric power is supplied by an A.C. motor, 10 H.P. (for the coal-breaking plant), and one A.C. motor, 7½ H.P. (for the elevating plant). The superficial area of the condensers, including foul main, is 3462 ft., with an approximate capacity of 350,000 c.ft. per day. There is a Livesey washer of 1 million c.ft. per day capacity, and a washer-scrubber capable of dealing with 500,000 c.ft. per day. The exhausters are of the two-blade type, each of 30,000 c.ft. per hour nominal capacity. The purifying plant consists of four 30 ft. by 20 ft. by 5 ft. boxes of a capacity of 1 million c.ft. per day. The station meter will register 40,000 c.ft. per hour. The gasholders are of 600,000 c.ft. capacity. The new sulphate plant (which is under erection) will be capable of an output of sulphate of ammonia from 3° Twaddel liquor equal to 2 tons per twenty-four hours. The old sulphate plant (now disused) is of the vacuum type; the output of sulphate of ammonia per twenty-four hours, with 3° Twaddel liquor, being 6 cwt.

Civic Welcome and Luncheon.

At half-past twelve o'clock the Company adjourned to the Lesser Town Hall, where, in the unavoidable absence of Provost Lang, Bailie Keanie (the Convener of the Gas Committee) and other members of the Town Council extended a civic welcome to the visitors.

Bailie Keanie, who occupied the chair at the luncheon (which was generously provided for the members by the Town Council), said that when it became known that the members of the Association, of which Mr. Dickson was President, proposed paying a visit to the borough of Johnstone it was cordially agreed by the Town Council that something should be done in the way of civic entertainment and hospitality. The feeling of the members seemed to be that in thus recognizing the Association they would possibly get some education for themselves, and perhaps share in some of the reflected glory of their worthy Gas Manager, Mr. James Dickson. During the past few years it had been rather interesting to himself to watch the progress and development of the gas industry. With the introduction of vertical retorts, he supposed he was correct in saying that the industry had been practically revolutionized; and without entering at all into details, he felt certain that the members of the Town Council of Johnstone who were present would derive considerable benefit from the papers that were to be read and discussed. Personally, he was sorry that Provost Lang had not found it possible to be in attendance at this early stage of the proceedings; but there was a possibility that he would be able to join the company when, later in the day, they visited the engineering works of Messrs. John Lang and Sons.

The President, after luncheon had been partaken of, asked the members to join in a hearty vote of thanks to the Provost, Magistrates, and Town of Johnstone for their hospitality. Bailie Keanie, as they had heard, considered it the right thing that corporations and town councils should extend a civic welcome in this form. While that was possibly so, there was some difficulty in getting town councils to give effect to their own ideas as to civic receptions, because it had to be conceded by everyone that the times were troublous. After all, the country was in a state of nervous tension, and, as the saying went, "trouble loomed round the corner." In the circumstances, he felt that to the Town Council of Johnstone were due their heartiest thanks for the hospitality shown to the members of the Association.

Bailie Keanie, having briefly acknowledged the vote of thanks, vacated the chair in favour of the President: and the business part of the day's proceedings was entered into.

The President's Address.

The President at this stage read the following address.

Gentlemen,—The work of the North British Association of Gas Managers constitutes an honourable and valuable record in the annals of the gas industry. In returning you thanks for the trust you have reposed in me by my election as President, I wish to assure you of an earnest desire on my part to assist in raising higher the important technical work associated with our past history. The responsibilities attached to such a task, however, do not lie lightly on my shoulders. The track has been well beaten by many prominent gas engineers, who have occupied the position and left their mark on the work of the industry; and in the year of grace 1921—with our industry passing through perhaps the most critical year of its existence—it is my first thought that any success that may (now or hereafter) attend the union now consummated between the North British and the Informal Meetings will be largely due to the inspiration and help which the President and Council for the time being derive from the hearty co-operation of the general body of members. I feel that you concur in this sentiment, and taking the word for the deed we shall contrive to forge into the chain of memory another link that will survive by reason of the strength of its material and the spirit in which the work is carried through.

The town in which you meet to-day suffers from the prevailing depression of trade. But Johnstone's engineering products have a first-class reputation the world over; and probably during the late war no town of the same size sent out from its workshops more machine tools than this engineering burgh. Within sight almost of our meeting place are the blae-bings of the old Clippens Oil-Works, where Mr. William Young, whose memory we keep green in our Memorial Lecture, laboured during a very important stage of his life upon those problems of carbonization and condensation as a result of which standard contributions were made to the proceedings of the North British and the West of Scotland Gas Managers' Associations, as well as the general fund of technical literature of the gas industry. The district, therefore, has been the scene of events which have contributed their quota to the life of the gas industry.

During the past forty years the gas-works in Johnstone have gone through three stages of reconstruction—with the third only partially carried through, but likely when completed to supply the district for many years. There only remains of the first a derelict retort-house, which contained direct-fired settings. In the year 1900 a new retort-house with regenerative settings was put-down, along with the present condensing, washing, and exhausting plant, to the designs of the late Mr. M'Gilchrist. In 1912, the Wilson vertical retort was adopted by the Town Council during the term of office of my predecessor, the late Mr. R. L. Deans, who, unfortunately, passed away before the completion of the work. Since then considerable additions to plant have been carried out; and the works are now, with the exception of the condensing and exhausting plants, capable of meeting a very much higher demand than we are presently called upon to supply.

Before long we shall be calculating working costs and selling gas in therms, and many new problems await us. In our own case no decision as to the declared value of the gas in B.Th.U. has been come to; but it would appear from a range of experience in the supply of grades varying approximately from 575 to 400 B.Th.U. and on some occasions (as, for instance, during the period of the railway strike) as low as 380 B.Th.U. that one is warranted in stating that a declared value of (say) 433 B.Th.U. would give, with moderate steaming in vertical retorts, an economic return which would in the long run benefit the undertaking and the consumers. At this figure a yield 16,500 to 17,000 c.ft. of gas could be obtained, and coke figures improved per ton of coal over those obtained with higher yields, which in our case have been obtained at the expense of fuel consumption increasing in greater ratio than the gain warranted in therm yield of gas per ton. The fact that in this case the heat has to travel from the surrounding flues through the brick walls of the retort, and raise the mass of fuel to a temperature high enough for the production of a good heating gas—which means keeping-down the carbon dioxide, and raising the hydrogen and carbon monoxide content of the resulting dilution brought about by the conversion of the steam—affects the heat-balance detrimentally, and places it in a different category from direct heat applied to the coal in the retort itself. At the same time, it has to be admitted that the problem, in its commercial aspect, now bristles with queries as to the future market prospects of residuals; and blue water gas production and total gasification will have their advocates when circumstances demand. Where, however, an ample margin of vertical retort carbonizing power exists, it appears to me that everything can be satisfactorily accomplished by this, up to the critical point which each one of us will find according to his own particular circumstances.

In Johnstone we have no need to fear the inadequacy of our trunk main system. Internal piping of houses will continue to be a source of trouble; and although this has been a crying evil for many years past, I am thankful that many proprietors are beginning to meet us in recognizing, with the development of gas consuming appliances, the need for larger-sized piping. At three extreme points of our trunk-main system—situated respectively four, two, and one-and-a-half miles from the works' governor—the available pressures on 2-in. mains in these districts at periods of maximum consumption are 5, 3·2, and 4·2 in. respectively with a works' governor pressure of 4·5 in. The first-named figure is due to the higher level of the district as compared with the works. It is interesting to note here that 400 yards of 15-in. trunk main taken over from the old Company in 1878 still serve as our main supply from the governor to the town.

Our vertical retort plant in the winter of 1913 had an average daily output in therms of 2587—*i.e.*, 18 retorts × 25,000 c.ft. × 575 B.Th.U. ÷ 100,000 B.Th.U.—while obtaining a gas

yield without steaming of 10,000 c.ft. of gas per ton. For the year ended May 15, 1919-20, the yield has been 15,666 c.ft. of an average calorific value of 462 B.Th.U. and 15,861 c.ft. of 458 B.Th.U. respectively; and during the current year the maximum demand has been met by ten retorts giving an average yield of 48,000 c.ft. of 445 B.Th.U. gas, resulting in a daily therm output of 2136 for ten retorts, or 3845 for the full bench—an increase of 48·62 p.ct. The gas yield per ton to the end of March, steaming at 30 lbs. pressure through ¼-in. nozzles was 15,955 c.ft. per ton; and the average of the tests for calorific value taken throughout the period was 456 B.Th.U.

An appendix shows our progress during the past ten years. The decade is chosen because in the year 1910-11 the horizontal carbonizing, purifying, and storage plants were taxed to the utmost, and plans were being made for an extension. Another appendix shows the capital expenditure, the outstanding loan debt, and interest and sinking fund charges for the same period. This included the erection of a vertical retort bench of eighteen retorts, with coal breaking and elevating plant, a gasholder with steel tank of 350,000 c.ft. capacity (prepared for 500,000 c.ft.), four purifiers, 30 ft. by 20 ft. by 5 ft., boiler (Lancashire, 26 ft. by 76 ft.), chimney, seating and house, meter (40,000 c.ft. per hour) and house, Livesey washer (1 million c.ft. per day), tar dehydration plant for a throughput of 20 tons per day, underground tar and liquor storage tank of a capacity of 335,000 gallons, besides the concurrent capital expenditure on mains, meters, and stoves. During those years the total expenditure amounted to £33,245, and the outstanding loan debt was increased by £15,932 only.

Although most of the extensions were carried through at what might be called (in the light of present-day prospects) bargain prices, the effects of the increased gross profit thereby necessitated in order to pay interest and sinking fund charges have been reflected in the valuation of the undertaking, and taxation, both local and imperial, has shown an extraordinary increase. This is shown in a third appendix.

Those who are now called upon to construct new works at high rates of interest, and with prices for materials three times the figures ruling in 1914, are hardly to be envied. Many extensions have been delayed by war conditions, or by a *laissez faire* policy adopted previous to this; and the economies now effected are not likely to make themselves so evident in the selling price of gas as would have been the case had the work been undertaken earlier. As some set-off against these, it should be made certain that all legitimate allowances as deductions from valuation for tenant's capital are obtained; and in the case of income-tax the value of the disused plant.

The nature and extent of the allowances granted by the local assessor for tenant's floating capital has been rather a contentious one with us for some years past; and intimation was ultimately given to the sheriff last year of the desire of the Town Council to have their works placed under the jurisdiction of the Assessor of Railways and Canals, whose valuation of the undertaking for the year 1921-22 has now been made. It shows a very considerable increase in the claim for tenant's chattels, with one-half instead of one-third the net annual expenses, and 6 p.ct. instead of 5 p.ct. interest on the total sum.

In the course of discussion, we shall doubtless have more enlightenment upon these and many other problems that affect the work of the gas engineer, whose duties and interests are constantly becoming more widespread. One set of circumstances which tended to thwart his best-considered schemes has just disappeared when another set arises like the Phœnix from its ashes. It must now be clear to everyone how necessary to the welfare of the industry have become the National Gas Council, the British Commercial Gas Association, the Commercial Sections of the various districts, and the Sulphate of Ammonia Federation. Yet if these are not supported by all who can contribute in a technical sense, the work of the industry will suffer. We must not lean upon but rather give our share in helping along, the good work which these bodies are doing. The nerve centre of the industry will continue to abide in the work of the Technical Associations, if we prove our capacity for the new tasks that await us. Let us, therefore, keep our minds alert upon every means to which gas may be usefully and economically applied in industry or in the household; and with "only the best" carbonizing results as our sure shield, we shall go forward not hindered, but rather helped, by every form of competition.

DISCUSSION.

Mr. J. W. M'Lusky (Glasgow) said he felt the members of the Association ought to congratulate Mr. Dickson on having handled his subject most clearly and concisely. The first point that struck him as noteworthy was that the trunk main which was laid in 1878 was still capable of serving a modern works with a manufacture of 120 millions or more. It was of interest to learn that this trunk main pipe was of cast iron. He felt they ought to compliment those who had charge of gas affairs in Johnstone as far back as 1878. They were to be complimented on their foresight, because Johnstone then could only have been a small engineering district. Those of them who had occasion to move about the country were bound to feel that the foresight of the gas pioneers of old in Johnstone was sadly lacking in many districts—not only in Scotland, but in England as well. In the course of his address, the President had made an allusion to vertical-retort plant. Here he (the speaker) desired to say that the subject was one which every man had to consider fairly in the light of the circumstances peculiar to his own district. For example, what suited in Johnstone might not fill the bill at all in Paisley; and what was expressly suited to the needs of Paisley might be out of sympathy with the requirements of Glasgow. They all knew quite well that if a consultant was called in, the first person he sought to interview was the manager, from whom he was bound to secure the necessary local touches. On a subject of this kind one could not dogmatize at all. Local circumstances were such that one manager could sell coke with comparative ease while another manager might find it a very real and genuine bugbear. In little details like this, gas managers were not yet masters of their own fate nor captains of their souls. In the course of his address Mr. Dickson had furnished the members of the Association with very striking figures bearing upon the progress that had been effected in the Johnstone undertaking since he took over the reins of office. It was little wonder the members had been entertained to a luncheon by the Town Council of Johnstone, because such figures as their President had disclosed as to the increase in consumption were well worthy of a luncheon in the afternoon and a dinner in the evening? [Laughter.] In what he had done, Mr. Dickson had revealed the best possible form of management, in that he had cut down capital expenditure while forcing-up the sales.

Mr. Charles Fairweather (Kilmarnock) remarked that there was one point the President had touched upon in his address that rather interested him. This was the proximity of the Clippens Oil-Works to the town of Johnstone. It recalled to his mind the fact that in the early days his own father had been very friendly with William Young. It seemed to him that the town of Johnstone was very fortunate in having such a large distributing system for the supply of gas. It was within his own knowledge that there were many places not nearly so fortunately situated as Johnstone, because the mains and the branch-pipes were far too small. The difficulties which had arisen in the districts he had in mind could easily have been remedied provided the mains and branch-pipes had been similar in size to those in Johnstone. Regarding the point that had been raised as to the future market for residuals, he agreed that the question was looming very largely before them. During the war they had all been fortunately circumstanced in so far that many different channels were open to them for the disposal of residuals. Coke was one notable instance where, during the war, they got something like a commercial return in proportion to the relative market for the commodity. In pre-war days—ten or fifteen years ago—coke was such a positive drug on the market that at the New Year season a gift of 200 tons or so was made-over to the poor people of the neighbourhood, while the members of the gas-works' staff always received a ton of coke as a sort of *solatium* or *honorarium* for services rendered. This matter of residuals was one that called for close attention in the future.

Mr. John Smith (Stirling) remarked that he had gone over the President's address very carefully. He felt there were many points in it that would repay further study. In Johnstone, so far as valuation was concerned, they seemed to be circumstanced similarly to Sterling. The figures Mr. Dickson had incorporated in his address were of peculiar interest to him (the speaker); and at his leisure he proposed working-out the comparative results relative to taxation as between Johnstone and Stirling. In Stirling they had been under the Assessor of Railways and Canals for some considerable time (a matter of fourteen or fifteen years) and their experience had gone to show that the arrangement worked harmoniously and satisfactorily to both parties. He thought the Town Council of Johnstone had been well guided by their engineer in effecting a change in the assessorship. Then it had been a gratification to him to observe that Mr. Dickson and the Town Council in Johnstone were talking and thinking in therms. This was a subject that most of them in the near future would have to devote attention to. He could assure the members of the Association that it was rather a difficult thing to think and talk in therms after the length of time they had been accustomed to talking and calculating in terms of cubic feet. Frankly, he felt quite certain that their President would not stop at the substantial increase he had already effected on the 1914 figures and results, but that the development in the output of manufactured gas would continue as the years went on.

Mr. J. Campbell (Dunfermline) narrated an experience of his own which went to prove the value and importance of taking pressure records in certain of the districts. He was particularly interested in the part of the address where the President said "it should be made certain that all legitimate allowances as a deduction from valuation for tenants' capital are obtained, and in a case of the income-tax the value of the disused plant." He rather felt there was an error here, and that what was meant was the value of the new plant and not the value of the disused plant. His opinion was that the Assessors had instructions to make allowances in respect of replacements and not on the value of the old plant that was replaced.

The President said he should like to put on record their appreciation of the assistance he received from Mr. Glover, the Town Chamberlain of Johnstone, in the preparation and compilation of the return for income-tax purposes. Mr. Glover, who was present with them that day, had co-operated with him most heartily. The Assessor of Railways and Canals had allowed a deduction for income-tax to the extent of between £500 and £600 in respect only of old and disused plant. They got a deduction in respect of a retort-bench of £8; and there was another bench of 31 firebrick horizontal retorts, taken-over by the old Company in 1879, and valued at £830, for which a deduction was allowed. The point that really emerged was this—what money would it take to replace the old plant now? He supposed that the argument which ought really to be used in questions of this kind was not altogether the actual value of the disused plant but what it would cost now to put in the plant as new.

Mr. John Ballantyre (Hamilton) said like the others who had spoken he personally felt very much indebted to Mr. Dickson for arranging the visit to Johnstone and for his address. When the question was raised by the Council whether the spring meeting of the Association should be held in Glasgow or in Johnstone, it was considered doubtful whether a gathering at the latter place would be a success. The presence of so many members in Johnstone fully justified the choice that had been made, and demonstrated that the experiment of meeting together in Johnstone had been a success in every sense of the term. Candidly, he felt there was something to be gained by getting out to the towns of Scotland and seeing what developments were being carried on. Those who had been privileged

to visit the local gas-works in the course of the forenoon would have noticed the reconstruction work that was going on to which Mr. Dickson made allusion in his address. For many years now he had gone on the policy that it was a mistake to persevere with old plant when it was more or less obsolete. By far, the wiser plan was to introduce the newer and more modern type of plant out of which it was possible to get a decent income. Of course he was thoroughly well aware that many people scrupled about scrapping old plant—they were disposed to hang on to it as long as they possibly could. To his mind this was a real mistake. On many occasions in his own experience he proved it to be a fallacy. New plant, provided it was the right type of plant, always paid. It did seem to him that the Johnstone Town Council had shown prudence and wisdom in reconstructing the works and in installing plant capable of carbonizing coal at the cheapest rate possible. Frankly, he had to congratulate Mr. Dickson on being able to purchase coal at a little less cost than he (the speaker) did in Hamilton—despite the fact that Hamilton was in the very heart and centre of the Scottish coalfield. In previous years they had always been able in Hamilton to purchase their supplies at a slightly lower rate than was possible in Johnstone; but last year Johnstone had beaten Hamilton. Then he had to congratulate the President on being able to get his local landowners and proprietors to meet him in connection with his scheme for the enlargement of the service supply-pipes. Very few of the managers in Scotland had been able to get the local proprietors to go as far as that; and it seemed to indicate that, taken all over, they were a very enterprising and go-ahead lot in the borough of Johnstone. It would seem as if it had been an advantageous step for the borough of Johnstone to arrange for being assessed under the Railway and Canal Commissioners, because, as Mr. Dickson had shown in the statistical tables which accompanied his address, the average assessment for the past three years was only £3857—as compared with £4536 under the old régime. This was a most substantial concession and must mean a great deal to the community of Johnstone. With regard to the point raised by Mr. Campbell, of Dunfermline, he had the notion that this gentleman was confusing income-tax allowances and deductions associated with local valuations. For local valuation purposes he believed the position to be this. One-sixth was allowed on buildings and heritable plant; but there was no allowance for depreciation. For local assessment purposes there was no allowance whatever for depreciation. There was an allowance in respect of meters, cookers, gas-fires, and movable tools; but the same principle did not apply to what were called fixtures. It seemed to him then that the point Mr. Campbell had raised earlier in the discussion had a bearing only on returns for income-tax purposes. He was glad the President, in his address, had touched on the subject of charging under the new Gas Regulation Act. It was a point which would emerge again when Mr. Braidwood's paper came up for discussion. He supposed that many of them had come to the conclusion that the great mass of the consumers were not concerned whether they were charged in terms of therms or of cubic feet. What troubled them in the whole question was the £ *s. d.* part of it. In the district whence he came, people had complained to him that although they had actually burned less gas, they were faced with bigger bills. To the best of his ability he had explained the position to them; and they had gone away thoroughly satisfied. It had never really dawned on them that while it was admittedly true that they had burned less gas, they were confronted with heavier gas bills because of the enhanced cost now involved in maintaining the gas services. It was the £ *s. d.* of bills that bothered consumers most of all. That was their chief viewpoint. He believed the ordinary consumer would derive some benefit when the provisions of the new Gas Regulation Act came to be applied. Of this also he was equally convinced—that the application of the Act would entail a very large volume of additional work on the clerical staffs of a corporation, whether in the Town Chamberlain's office or in the gas office of a municipality, he could not definitely say. He thought, however, that if some arrangement had been made whereby the value of the gas was declared in B.Th.U., it would have met the whole circumstances of the case and saved much trouble and calculations in terms of therms.

Mr. John Wilson (Motherwell) observed that he was not altogether in sympathy with the President's preference for being assessed by the Assessor of the Railway and Canal Commissioners. He had a substantial reason for venturing this opinion, because he had taken his own plant and calculated on the lines explained by the President, and found to his amazement that he would have been nearly 40 p.ct. worse off if he had been assessed by the Assessor of the Railway and Canal Commissioners.

The President: Do you get renewals, Mr. Wilson?

Mr. Wilson: No, we do not get renewals.

The President: That is an important point.

Mr. Wilson: But we get credit for the sales of our cooker plant off capital; and it works out almost as well. It would be very interesting to me at any rate if you could enlighten me with relation to Appendix IV. Proceeding, Mr. Wilson explained that in a large part of his district they had been forced to lay-down a trunk main at a greatly increased capital cost. In the town of Wishaw—the newer part of the burgh of Motherwell—they had shown splendid foresight a few years ago by laying-down a 12-in. main. The benefit of this foresight was now being reaped. It seemed to him that the gas managers of Scotland had got to keep a watchful eye on the various housing schemes that were being projected. In the area where he was, he had something like nine different housing schemes going. It required persuasion to convince some promoters that the piping arrangements they were making were hopelessly inadequate for the present time. So far as the residuals market was concerned, he thought Scotland had a very just and genuine grievance at the present juncture. He would point to the fact that during the war quite a number of the North of England undertakings did a tremendous business in coke. Now, however, that the foreign markets were closed to these people, they were underselling and competing with traders in Scotland. That was not at all fair. These people in the North of England ought to seek out their own salvation in their own country, and confine themselves within their own borders. As things were, traders in Scotland had sufficient trouble to get rid of their own coke without being asked to compete against any underselling from the North of England.

The President, in view of the remarks by Mr. Wilson, supplied a few additional details by way of explaining the deductions allowed and the allowances claimed but disallowed by Appendix IV.

Papers and Discussions.

Papers were thereafter read by Mr. George Braidwood, of Coatbridge on "The Therm: Notes and Comments," and by Mr. Henry Rule, of Kelty, on "Working Results in a Tully Plant."

THE "THERM:" NOTES AND COMMENTS.

By George Braidwood, of Coatbridge.

By the passing into law of the Gas Regulation Act 1920, the gas industry has accepted an entirely new method of charging the consumer for the gas he uses. The Act, among other things, gives power to the Board of Trade, while fixing the standard or maximum price per "therm," to make such allowances as will give the undertakings the financial relief which is necessary, due to the changed circumstances brought about by the war. Objection to the new method of charging has been made in certain quarters; but the general view is that a good purpose will be served by the change. The fact, however, should not be lost sight of that the change in the method of charging was not asked for by the gas industry, but was proposed by the Fuel Research Board of the Committee of the Privy Council for Scientific and Industrial Research. Numerous undertakings have already made applications to the Board of Trade to be placed under the new method of charging; two Scottish undertakings being among the number.

How these new methods will affect the consumer, the shareholder, and the gas undertaking generally, is a problem causing concern to those responsible for the policy of all gas undertakings, and especially to those in charge of statutory gas companies. Under the new method of charging for the B.Th.U. delivered, the consumer is—subject to the control tests being properly applied—guaranteed 100,000 B.Th.U. of heat for every "therm" for which he is asked to pay. Once he can be got to understand this, the suspicion will be removed that he was sometimes being asked to pay so much per 1000 c.ft. for something which he thought was not always gas. In short, he is assured of a square deal. The consumer supplied by a company, however, will be required to pay a little more for his gas, to enable the undertaking to earn sufficient extra profit to meet the increased cost of manufacture since 1914 and to pay approximately pre-war dividends.

The consumer need not be concerned about the "declared" heat value of the gas supplied, as no undertaking is likely to make a drastic change in the heating value of the gas all at once, in view of the fact that all appliances must be adjusted to suit the value declared. Given the pressure prescribed by the Act and properly adjusted appliances, the consumer cannot be placed at a disadvantage. Further protection is afforded to the consumer by the clause in the Act which makes an undertaking liable to certain penalties, should the quality of the gas fall 5 p.ct. below the declared value. It appears to me, however, that this penalty clause is unfair to the gas undertakings, in so far as it operates only in favour of the consumer; the undertakings getting no corresponding advantage if the gas supplied is above the declared value. As a matter of fact the undertaking will, to maintain a safe margin, require to supply constantly a value in excess of the declared calorific value, thereby supplying the consumer with something for which he is not paying. The Act, while allowing a margin of 5 p.ct. makes it impossible for an undertaking to take advantage of this clause, owing to the insertion of another, which states that if in any quarter the average calorific value is less than the declared value, a sum which the chief gas examiner shall determine to be as nearly as may be the amount by which the revenue of the undertakers has been improperly increased shall be deducted from the amount applicable to the payment of dividend, &c. Had it been arranged for the undertaking to derive an advantage should the quality go above the declared value, there would then have been no reason for running the quality of the gas to the lowest allowable point. The other view of course may be that the quality will be kept more constant under the clause as it stands. In any case, no criticism can alter the clause, as it is now law.

Control Testing.

To protect the consumer and keep the undertakings up to the mark, with regard to the quality of the gas supplied, competent and impartial persons will be appointed by local authorities to carry-out the tests for calorific value, subject to the prescription of the Gas Referees as to testing. When one considers the competency, &c., of the persons making the tests in the past for local authorities, the consumer would have been better served had the framers of this clause arranged for such persons being required to satisfy the Gas Referees as to their competency to carry out their prescriptions. This omission appears peculiar, in view of the fact that the Act provides for an examination for the purpose of ascertaining whether applicants for the post of meter inspectors have sufficient practical knowledge, while no provision is made for ascertaining the ability of a gas examiner, who is required to carry out what is admitted to be a very technical operation.

Works over 100 millions output are required under the Act to supply and maintain a recording calorimeter. The industry awaits

anxiously the information as to what type of recording calorimeter will be prescribed. All the recording machines with which the writer is acquainted require fairly frequent checking and adjustment. To prevent tampering, the machine will require to be kept locked; and this will prevent adjustments being made as found necessary by tests made on the water-flow machines. The view is held generally by gas engineers that only tests made on water-flow machines should be taken as sufficiently accurate on which to penalize the undertaking.

To secure accuracy in testing for calorific value, particular attention should be paid to the calibration of thermometers, measuring vessels, &c., as it is unlikely that the Gas Referees will accept a calorific value result, the test for which has been made on a calorimeter, the thermometers of which have not been calibrated.

Calibration of Thermometers.

It may be of interest to give here figures showing the correction required to be made on two typical calorimeter thermometers. The correction to be applied to the scale readings being determined by comparison with standard instruments at the National Physical Laboratory, Teddington.

Inlet Thermometers.			*Outlet Thermometers.*		
Reading.		Correction.	Reading.		Correction.
At 0° C	−	0·08	At 0° C	−	0·08
5 ,,	−	0·06	5 ,,	+	0·02
10 ,,	+	0·04	10 ,,	+	0·22
15 ,,	+	0·06	15 ,,	+	0·06
20 ,,	+	0·10	20 ,,	+	0·06
25 ,,	+	0·10	25 ,,	+	0·14
30 ,,	+	0·10	30 ,,	+	0·22
35 ,,	+	0·12	35 ,,	+	0·18
			40 ,,	+	0·20
			45 ,,	+	0·16
			50 ,,	+	0·14

The Declared Calorific Value.

To allow of the freedom which the industry has desired for so long, and which is essential to progress, it would appear as if no objection will be taken by the Board of Trade to any reasonable quality being declared and supplied, so long as the other conditions with regard to the regulation of appliances and the maintenance of the minimum pressure prescribed are all observed. Values as low as 300 and 350 B.Th.U. appear to be contemplated, as provision is made for such qualities in the schedule accompanying the Orders. A minimum permissible pressure of 25-10ths is prescribed if the declared calorific value be below 350 B.Th.U.; while with a declared value of below 300 B.Th.U. the minimum pressure shall be such pressure (not being less than 3 inches) as shall be prescribed by the Gas Referees.

The fixing of the calorific value to be declared, while of the utmost importance, should not be a difficult problem. After all, the heating value of the gas which can be supplied depends on the type of carbonizing plant employed or intended to be employed. It is considered that very little alteration will be made at first in the quality of the supply, in view of the easy manner in which a different declared value may be obtained. A new declared value may be obtained in Scotland by giving three months' notice of intention to make an alteration; this notice to be published in the "Edinburgh Gazette," and served on all consumers. While the consumer need be little concerned about the declared calorific value, it should be added that this is only so if the distribution system is right. But this point must have had the attention of the Board of Trade when fixing the minimum pressure of 2 inches.

While the Act was being considered by the House of Lords in Committee, an amendment was proposed, but subsequently withdrawn, that an undertaking, in the case of an alteration in the declared value, should be required to take the necessary steps at their own expense to alter, adjust, or replace service-pipes as well as burners and appliances. The amendment, had it been carried, would have been most iniquitous, and would have committed the undertaking to liabilities which could not be defined.

However, the question of service-pipes is one of the greatest importance. It is well known that the bulk of complaints of bad supply is due to the inefficient service-pipes which are not the property of the undertaking supplying the gas. Gas undertakings are not in a position to compel owners of properties to provide adequate service pipes. Undertakings should, therefore, when the opportunity occurs, ask for powers to compel owners, where new buildings are being erected, to provide and maintain service-pipes of a proper size, and so enable the consumer to obtain the volume necessary to give him the therms sufficient for the efficient working of his appliances. Control by the undertakings up to and including the meter is essential to efficiency. While not yet a practical proposition, it is bound to come. In any case, undertakings will be required to spend more money on their outside departments than before, in view of the stipulation in the Act regarding the regulation of appliances. It is also probable that some undertakings may require to instal pressure-raising plant, so as to maintain at certain points on their districts the minimum pressure prescribed.

Making the Therm.

At no time in the history of the industry has the gas engineer had a wider choice of plant with which to produce the therm. The relative merits of the different types of plant, however, have not yet been definitely decided, nor can it be said that engineers are in any way unanimous as to which plant, or combination of plants, will deliver therms at the lowest cost. The new method of charging now makes it possible for gas engineers to work the plant at their disposal in the most efficient and rational manner. Carbonizing plant obviously designed to make a good-quality gas need not now be pushed to produce large volumes of lower quality gas—a proceeding which appeared to be fairly common practice during the war years. On the other hand, every advantage may be taken of the newer types of plant and methods of carbonizing now on the market. Had the new method of charging come into being along with calorific value testing, some years ago, it is a question if there would have been any necessity for an inerts inquiry now. How to make the therm at the cheapest possible price will now be the chief problem for the gas manufacturer. Fortunately figures are already available in the Technical Press which have a direct bearing on the problem.

So far as Scotland is concerned, the gas-works with vertical retorts and steaming have, during recent years, held the leading places as regards low selling price per 1000 c.ft. With vertical retorts and steaming a figure of about 7¾ million B.Th.U. per ton of coal may be expected with good working. What can be done with verticals and steaming has been fully demonstrated at Uddingston; and the results obtained by Mr. L. Hislop and the Gas Investigation Committee were fully reported in their fourth report to the Institution of Gas Engineers last year in London. These results are, I believe, capable of improvement by an alteration in the method of heating. Excellent results are also being obtained in certain works in Scotland with a mixture of blue water gas and coal gas from horizontal retorts. At the works of the Stirling Gas Light Company a figure of 7,834,300 B.Th.U. per ton of coal is being obtained with regularity; and at Coatbridge somewhat similar results are being obtained.

The plant employed at Stirling is a well-known type of blue water gas plant, the gas from which is mixed with coal gas of

Schedule Statistics.

Figures given below, taken from the Schedule submitted to the Board of Trade, indicate clearly the position of the two Companies at June, 1920, and as to whether or not financial relief was required, as provided for by the Gas Regulation Act, 1920.

	Coatbridge Gas Company.				Stirling Gas Company.		
	1914. Per 1000 c.ft. sold.	1920.			1914. Per 1000 c.ft. sold.	1920.	
Coal	16·44	27·93		..	17·77	36·45	
Coal, less residuals	·98	8·54		..	7·0	8·67	
Coke for water gas	—	2·28		..	—	—	
Manufacturing expenses	6·04	10·52		..	12·37	25·17	
Distribution expenses	4·69	4·88		..	3·63	5·80	
Rent, rates and taxes	1·51	2·23		..	2·97	4·42	
Management expenses	1·45	2·37		..	1·00	1·56	
Miscellaneous expenses	·15	·15		..	·05	·13	
Total net expenditure on revenue account	14·80	30·97	= 109 p.ct. increase.	..	25·92	44·94	= 73 p.ct. increase.
Total revenue	20·44	37·11	= 81 p.ct. increase.	..	30·73	52·29	= 60 p.ct. increase.
Rate per 1000 c.ft. sold.	1s. 6d.	2s. 10d.	= 89 p.ct. increase.	..	2s. 6d.	4s. 6d.	= 80 p.ct. increase.
Dividend paid	£9 2s. p.ct.	£6 6s. p.ct.	= 30 p.ct. decrease.	..	£6 p.ct.	£3 p.ct.	= 50 p.ct. decrease.

The claim for a price per "therm" was, of course, based on estimated figures applicable to the time of application.

The final price per "therm" asked for by the Coatbridge Gas Company was 12·55d., and by the Stirling Gas Light Company, 15·00d.

The Board of Trade, in an Order under section 1 of the Act, have granted the Coatbridge Gas Company a price of 11·8d. per "therm," and the Stirling Gas Light Company a price of 14 6d. per "therm," with a 0·2d. per "therm" slide for dividend purposes in both cases.

These prices will allow of pre-war dividends being paid with the gas-rates presently being charged.

652 B.Th.U. quality from machine-charged horizontals. The detailed figures may be of interest:

Analysis of Mixed Gas.	Per Cent.	Analysis of Blue Water Gas.	Per Cent.	Percentage of Blue Water Gas in the Mixed Gas. Per Cent.
CO_2	2·4	$CO_2 + H_2S$	3·9	
O	0·2	O	0	
CmHn	2·8	H_2	52·7	36
H_2	50·3	CO	39·0	
CO	19·6	CH_4	1·6	
CH_4	20·3	N_2	2·8	
N_2 (by difference)	4·4			
	100·0		100·0	

Mixed Gas.

Calorific value by calorimeter	516 B.Th.U.
,, ,, calculated	499 ,,
Make of mixed gas per ton of coal	15,700 c.ft.
B.Th.U. per ton of coal	7,834,000

Blue Water Gas.

Coke used per 1000 c.ft.	32·2 lbs.
Make per ton of coke	69,551 c.ft.
Calorific value	309 gross
B.Th.U. per ton of coke	21,491,259

High yields of B.Th.U. per ton of fuel are also claimed for plants capable of complete gasification.

When one considers that the ash content of the coke from vertical retorts is increased by something like 50 p.ct. by heavy steaming, it is surprising that much more has not been done in the way of making blue water gas in a separate plant, and mixing it with the gas from the vertical retorts. Many of the earlier installations of vertical retorts were not designed for heavy steaming; and the course necessary to alter the method of heating might be more profitably spent on an up-to-date water-gas plant. In any case, the repair charges on a plant which has been heavily steamed are likely to be very much higher than on a plant working without steaming.

As the capital cost of plant enters largely into the selling price of the therm (and after all it is the selling price which matters), it must be kept in mind that the cost of an installation of vertical retorts to-day is probably three times what it was in pre-war days. Labour charges, however, are with verticals very low; the saving effected acting as a set-off against the higher capital charges.

Certainly, high yields of B.Th.U. per ton are not confined to vertical retorts, and good results are obtained with the help of water gas and other types of complete gasification plants. But these points are certainly debatable, and are intended to cause a discussion.

The Therm Price: How to Obtain It.

Two Scottish sliding-scale companies, Coatbridge and Stirling, have already made application to the Board of Trade for a therm price, and have had same provisionally fixed. In the case of maximum-price or sliding-scale companies, it is not considered that any advantage is to be gained by delay in making application. In fact, it would appear as if companies whose financial year closes on May 15 and who have not yet made application will lose the benefit of any relief which may be granted under the Act for the year ending May 15, 1921; the clause in the Order reading thus: "And for the purpose of ascertaining the authorized rate of dividend for the year in which the declared date occurs, the price charged per 1000 c.ft. during that part of the year (if any) before the declared date shall be rendered into the equivalent price per therm by dividing it by four-and-a-half (where the declared value is 450)."

Both applications by the Scottish companies having been heard by the Board of Trade, it may interest intending applicants as to how they fared. In the case of the Coatbridge Gas Company's application, the local authority and the two railway companies lodged objections, while in the case of the Stirling Gas Light Company, no objection was taken by the local authority, but the Caledonian Railway Company objected. A glance over the objections by the railway companies shows that they urged that any Order which may be made should contain such provisions as will ensure an obligation on the part of the undertakers to afford an efficient supply of gas for the lighting of certain premises which they supply. Also that the undertakers had not indicated the standard calorific value to be fixed by the Order; and until such calorific value is indicated, it is impossible to consider the precise effect of the application with regard to (*a*) lighting efficiency, and (*b*) the prices proposed to be charged for the supply. Generally they desired to be heard with regard to the application.

It was stated in reply by the Coatbridge Company that as no alteration was proposed to be made in the conditions presently existing as to supply of gas to their premises, the lighting efficiency would not be effected. It was admitted that the model form of application did not state the proposed calorific value; but the documents submitted to the Board of Trade (copies of which the Railway Companies had received) stated fully the standard proposed. They claimed also that if the Railway Companies were to be given a hearing that the Gas Company be heard in reply. It may be stated here that nothing further was heard of the Railway Companies' objection at the inquiry before the Gas Administrator in London.

Objections by the Local Authority.

The objections by the Local Authority to the application by the Coatbridge Gas Company were of a more serious character, dealing chiefly with the rate of dividend which would be paid should the therm price applied for be granted. Briefly, the Local Authority were of the opinion that the selling price of 2s. 10d. at the date of the application was sufficient for all purposes; that the standard price of 2s. 6d. should not be departed from; and that the new standard price be 6·66d. per therm. In short they did not wish any alteration made on the pre-war standard price of 2s. 6d. per 1000 c.ft. fixed in 1909 in spite of the enormous alteration in circumstances due to the war. The application by the Coatbridge Gas Company was heard by Mr. H. C. Honey, the Gas Administrator in London, on March 3, 1921, when counsel and witnesses on both sides were heard. In the case of the Stirling Company, they appeared by invitation before Mr. Honey, and made certain explanations as to the schedule figures desired; no counsel or witnesses being necessary.

The calorific value to be declared by the Coatbridge Gas Company will be 450 B.Th.U., while the Stirling Gas Company have declared 475 B.Th.U. Orders in which the new charges are incorporated were submitted to the Companies concerned, so that the undertakings might make, if they so desired, any observations thereon to the Board of Trade. While the prices per therm fixed are lower than were requested, the Companies feel that an honest attempt has been made by the Board of Trade to give justice under the Act both to the Companies and to those who have the consumers interests at heart, while new capital will now be more readily procurable and assured of a fair return.

SOME RESULTS WITH A TULLY GAS-PLANT.

By Henry Rule, of Kelty.

As I have already given a paper elsewhere on the construction and working of the Tully plant,* will be my excuse for omitting any reference to these.

Results from Coke.

Up to the beginning of this year we were using in this plant practically all double or treble nuts from local collieries, because of the lower price per ton compared with coke. With the falling-off in the price and the demand for the latter, we have used it largely during the last few weeks. The coke contained 12·1 p.ct. of moisture, and the ash in the dried coke was 6·75 p.ct. The average of several tests gave a make of 50,500 c.ft. of 297 B.Th.U. gas (total heat).

The analysis of the gas taken from the relief holder was as follows:

CO_2	5·60 p.ct.
O_2	0·10 ,,
CO	40·20 ,,
CH_4	2·10 ,,
H_2	43·84 ,,
N_2	8·16 ,,
	100·00

No allowance was made for the fuel picked-out with clinker, and used in the boiler.

Results with Low-Grade Fuel.

A few weeks ago we tried selected table pickings and foul coal, which in the ordinary course are tipped in the redd bing at the collieries. These pickings contain a fair amount of coal, but are useless in the ordinary retorts owing to thin ribs of stone either adhering to the sides or running through the seam. Two lots from different collieries were used in the Tully plant.

In such a mixed lot, it was practically impossible to obtain anything like a representative sample. Several analyses were made showed the moisture to be from 2·4 to 3·8 p.ct., and the ash content ranged from 25 to 43 p.ct.

The plant dealt with the material well enough, though more work was required by the operator. Pricking-up had to be done every two hours; while each morning, before starting-up, there were considerably more stones and ashes to be taken out, as compared with ordinary fuels. I found the CO_2 content in the gas from this fuel higher than with coke or nuts; and we had also to work with less steam, due probably to the lower carbon content. These circumstances reduced the productive capacity of the plant, as we only got about 26,000 c.ft. per eight hours shift, as compared with 50,000 c.ft. with good coke or coal.

The results were:

	No. 1 Lot.	No. 2 Lot.
Gas per ton,	23,600	18,200
Tar ,, ,,	5 gallons	5 gallons
Calorific value of gas,	315 B.Th.U. gross	305 B.Th.U. gross

The average analysis of the gas turned out:

CO_2	7·5 p.ct.	
O_2	0·3 ,,	
Unsaturated hydrocarbons	1·2 ,,	
CO	34·4 ,,	
H_2 and CH_4	43·0 ,,	by difference
N_2	13·6 ,,	direct
	100·0 p.ct.	

Cost of "pickings" delivered at works	1·9d.	per 1000 c.ft.
Less tar	1·5	,,
Net cost of fuel =	·4d.	,,
Carbonizing wages	5·6	,,
	6·0d.	,,

* Paper before the Scottish Junior Gas Association, Dec. 11, 1920. See "Journal," Vol. CLII., p. 704.

The advantages from a national point of view of utilizing this waste material are obvious, and the cost is low; but against these are several disadvantages:

(1) Increased wear and tear on brickwork.
(2) Increased cost of wages for gasifying.
(3) Increased amount of clinker and ash to dispose of.

The second of these could be neutralized by having a plant of larger capacity, so that one man could make more per shift. The third one at present offers us no difficulty.

No. 1 lot was the better lot of the two, both for suitability in the plant and results generally. It was my intention to try this fuel again, both by itself and mixed with coke, and give you the results; but unfortunately time has not permitted me to do so. I certainly intend pursuing this further, as I believe later trials will enable us to better the results.

Results of Mixed Gas.

For the month of March our results were as follows:

Mixed Town Gas of 465 B.Th.U. Total Heat.

Gas per ton	12,700 c.ft.
Coke sold	8·1 cwt.
Tar and liquor	42 gallons.

The percentage of water gas in the above was about 33⅓ p.ct.

The results since the installation of the Tully plant last May work out as follows:

Gas made per ton	12,320 c.ft.
Coke sold ,, ,,	8·8 cwt.
Tar and liquor per ton	47·8 gallons.

Between the horizontal retorts and the Tully plant, the average make per man per shift for the past six months turned out:

October	23,000 c.ft.
November	23,700 ,,
December	26,200 ,,
January	26,000 ,,
February	23,400 ,,
March	22,000 ,,

The percentage of water gas that can be mixed with coal gas depends largely on the quality of the latter. In our case, with the nuts we are using, the richest quality, tested when the exhauster was off and no air was admitted for purification, was 575 B.Th.U. Owing to our purifiers being too small, we have to use an excessive quantity of air, which brings the quality to about 540 B.Th.U.; so that, in order to get a 465 gas, we cannot put more than 33⅓ p.ct. at present.

Our mixed town gas of 465 B.Th.U. total heat, contains:

CO_2	4·5 p.ct.	
O_2	1·6 ,,	
Unsaturated hydrocarbons	2·6 ,,	
CO	17·2 ,,	
CH_4 and H_2	61·6 ,,	By difference direct.
N_2	12·5 ,,	
	100·0 p.ct.	

District Supply.

As stated in my previous paper to the Junior Association, we found that, owing to the increasing consumption on our district, there were many complaints as to want of supply, particularly during the past winter. From an examination of the circumstances, I am of opinion that, with the reduced quality now supplied, 2 in. of pressure in the mains was not delivering the quantity of gas necessary for the consumers' requirements. The remedy therefore was to lay a feeder main from the works to the defective area, a distance of a mile. This has now been laid; and the 3 in. pressure obtained has cured the complaints.

Advantage of a Water-Gas Plant.

During the last miners' strike and the unfortunate one now going on, the plant has been a great asset in spinning-out our stock of coal. Indeed, we could not have pulled through the last one without it; and it looks like saving the situation on the present occasion also.

DISCUSSION.

The President said they were deeply indebted to the authors for the interesting and informative papers they had read. He took it as a great kindness on Mr. Rule's part that he should have come such a great distance to attend this particular meeting.

Mr. Laurence Hislop (Uddingston) said so far as his Company at Uddingston were concerned, they had decided to let sleeping dogs lie; and they were going to await the passing of one and a half years or two years before they would seek to introduce this new basis of charging by the therm. It was unfortunate he had not been furnished with copies of the papers prior to the meeting; because in such an event he might have made a study of the results and figures that were given. What he liked about the contribution by Mr. Rule was that the author gave an analysis of the gas he obtained from the experiments he tried. It did seem to him that the author was to be congratulated on experimenting with refuse coal, such as table pickings, &c. If the table pickings in Fifeshire were anything like what they were in Lanarkshire, it was really astonishing that the Manager at Kelty succeeded in getting any gas at all.

Mr. Samuel Glover (St. Helens), speaking as a visitor, said that there could be no gainsaying the fact that the paper they had just heard from Mr. Braidwood was an excellent contribution, and dealt with a subject with which they were now, so to speak, face to face. They really did need now to get quickly and fully into the atmosphere of thinking in therms. It ought to be a matter of little concern to them whether or not Mr. Braidwood had got some of his inspiration from the other side of the Tweed. It was sufficient to know that the author had effectively shown that some of the things for the ultimate good of the gas industry might, after all, have come from London. Personally, he was himself among those who at first resented the idea of being ordered or required to charge for gas in this new manner. He fully admitted, as had already been remarked by Mr. Ballantyne, of Hamilton, that it would cause a lot of trouble. He did think, however, that the next eighteen months might be profitably spent by all connected with the industry if they proceeded now to make a start in getting their figures in order. A study of a paper such as they had had from Mr. Braidwood was to be commended. He felt it would be advantageous if all managers would now start organizing the work in the office and in the rental departments. The sooner the work was tackled, and the question faced, the sooner they would be able to say they had overcome all difficulties associated with the new methods of charging. So far as the other subject treated by Mr. Rule was concerned, he had long since abandoned the idea of striving to get blood out of a stone. It did seem to him that the time was long past due when they should notify the coalmasters that they did not wish to be supplied with so-called coal containing so much foreign material that by no possible stretch of the imagination could it be termed coal. If coalmasters labelled a substance "coal," then it ought to be genuine coal, and not something or other intermixed with 15, 18, 20, 22½, or even 25 p.ct. of foreign matter. They ought to get coal from which it was possible to manufacture gas. The Tully plant at Kelty, in view of what Mr. Rule had stated, seemed to have been converted from one purpose to another. It appeared now to be utilized in the manufacture of some measure of water gas and some measure of coal gas. No doubt this was quite a proper thing to do in some circumstances.

Mr. S. B. Langlands (Glasgow) said that, despite all that Mr. Glover had said of a favourable nature, he had the decided feeling that this whole therm business was nothing short of pedantry. It seemed to him that if it had been decided to set forward on the face of an account what the declared thermal value was, and to have permitted people to make the computation for themselves, it would have been much simpler and much better.

Mr. Glover (interposing) said he did not think, after the legislation had been carried through, this was the proper time to object in all seriousness to what had been done.

Mr. Langlands contended that, with all respect to Mr. Glover, he was entitled to give vent to what were his own individual views on a question of some importance to the industry. Laws were not altogether in this country the laws of the Medes and Persians—they could be altered and revoked. Members of the Association had surely a right to express any objections they might have to the established laws of the land. So far as the provisions of the new Gas Regulation Act were concerned, he honestly did not see that anything was to be gained by the consumer. Under the old system a consumer could check his meter; but what was now proposed was much more difficult and complicated, besides involving gas companies and corporations in a vast amount of additional work. Mr. Rule's paper struck him that the author was somewhat of an experimenter; and he had laid down a standard in the way of research that many members of the Association ought to aim at emulating. His experiments with what might be called coal refuse were very daring, and the author had been manful and courageous enough to set forth the results in his paper. The results could not be characterized as ultimate results. He should rather say they were as yet the preliminary results of an experimenter who was doing the best he possibly could for the industry he represented.

Mr. J. Bell (Dumbarton) remarked that Mr. Rule was to be congratulated on utilizing what was generally regarded as refuse. The therm question was one with which all the members of the Association would have to make themselves familiar at a very early date, because with every passing day they were getting nearer the application of the Gas Regulation Act. The hints conveyed in Mr. Braidwood's paper would be most helpful to all the members of the Association. He would remind the meeting also that the British Commercial Gas Association had drawn up a series of most useful pamphlets dealing with this same subject. The facts were put very plainly and concisely—indeed, the entire position was so intelligently elucidated that the ordinary person could comprehend it by the application of a little time and study. The pamphlets which had been prepared by the "B.C.G.A." would be serviceable also to the gas consumers in enabling them to grip the niceties of this method of charging. Dealing with pressures and the calorific quality of gas, one might find himself "right up against it" in the distribution system; but the method that he (Mr. Bell) had adopted for many years was one that he could recommend to all the members of the Association. In the heaviest month of the year (November) they had pressures taken all over the district between the hours of 4 and 7 p.m. This was continued for about a week in November, which was unquestionably the period of highest consumption in Dumbarton over the whole year. The pressures were duly recorded, and next year the same procedure was followed. The annual records were then taken out and compared, with the result that it could be seen at a glance how far the town and district were being affected either by an increased consumption or by a lowering of quality. With such data before him, the manager could apply whatever remedy was required to get the pressures up to what might be called the proper working standard.

Mr. John Smith (Stirling) said that in Stirling they applied at the same time as Coatbridge (November, 1920) for authority to sell the gas in terms of therms. An Order had now been granted. The Order embodied only the financial aspect of the question; and after all this was the point that interested them most of all at the present time. Municipal bodies were doubtless concerned in the other portions of the Order relating to penalties. On the general question, while it was actually the case that objection had been taken to the method of calculating the account of consumers in therms, he personally did not think the change so revolutionary as compared with the criticisms that were offered when the present gas-meter came into vogue. Long ago the method of calculation was so many burners for so many hours; and the institution of a gas-meter to substitute that procers of calculation was regarded as something terribly revolutionary. He had not

the least doubt that in a very short time, once they began to apply the therm basis and to understand its working, they would find it a very easy method of calculation. So far as the general principles of the Act were concerned, little exception could be taken to them. The Act now was law; and no amount of argument could render it otherwise. One thing quite certain now was that the ordinary gas consumer was going to get in value exactly what he was paying for. He was going to get 100,000 B.Th.U. by paying for them—indeed, he was going to receive, as Mr. Braidwood had shown in his paper, "a little more than he paid for." This was a point in the Order that he could not remember at the moment whether it was raised or not. He felt, however, that it was a question that might have to be raised. For instance, they had to charge on calorific value over a very lengthy period. Now why should they not be allowed a price per therm if they were supplying more than 5 B.Th.U.? Mr. Braidwood had not touched specifically upon this point in his paper; but it occurred to him that it was a bargain that cut both ways. On the question of testing, it was quite clear that if practical results were to be obtained from the gas examiners or gas testers, they must be assured of having men who were thoroughly acquainted with the duties. As was indicated in Mr. Braidwood's paper, very little difference in the water level of the meter would show a wide variation over even a small quantity of gas measured in the ultimate calculation of B.Th.U. He had also worked out the results which Mr. Braidwood had given them and which applied to Stirling. They were worked out differently, as the calorific value was arrived at by the chemical composition of the gas rather than by the calorimeter reading. The figures taken in this case were those which Prof. Cobb had used at Uddingston, and he thought Mr. Lawrence Hislop, of that town, ought to be satisfied with such conclusions. Mr. Braidwood raised the question of main and service pipes, applicable to new houses in course of erection, and advocated that some method of control over these should be given. Stirling was a small provincial town; but even there he had found it a decided advantage to keep in close touch with local architects, and get them clearly to understand just what was wanted in the way of uniform piping. He was glad to be able to say that any new houses which had been erected in the neighbourhood of Stirling within the last ten years or so were being supplied with adequate sizes of piping for all purposes. It entailed a little bit of trouble at the outset to get in touch with the local architects; but matters had been much simplified now, because, when it was contemplated erecting a new house, the local architect concerned invited him to a meeting at which the whole matter of gas-fitting was discussed. This same principle was followed in connection with the municipal housing schemes in Stirling; and it was done on the recommendation of the architect, after conferring with him. The whole scheme of piping was submitted to the "D.B.M.S." in Edinburgh, and there was a wide difference between the latter schedules and the original schedules. He was glad, however, to be able to report that adequate piping was going into all the housing schemes in Stirling. This was bound to be satisfactory to the consumers, because it was guaranteeing to them the highest degree of efficiency. Mr. Braidwood's paper was certainly well worthy of serious consideration. No doubt most of the members would be going into the therm question very soon; and he could assure them that when they did approach the Board of Trade they would find the Department very sympathetic towards the gas industry as a whole. At Stirling they had received very satisfactory treatment at the hands of the Board. Of course, he did not mean to represent that exaggerated or frivolous applications could hope to be sympathetically received by them. In Stirling they proceeded on the lines of submitting quite a moderate view of their position between 1914 and 1920. As a matter of fact, the statement of the Gas Company was so moderate that the local authority did not consider that it was at all worth their while to oppose it. It was further an indication of the moderation shown in the Stirling application to mention the fact that the Board of Trade only reduced the price in the Order to something like 4d. per therm. Mr. Rule's paper was of particular interest to him, because he personally had been working with blue water gas for the last four months. It was really most valuable to learn that Mr. Rule had been able to gasify this material, which, after all, was nothing more than waste. It was but fair to say that the author's results were not final. As yet they could be only the results of the experimenter. Nevertheless, they were bound to concede that the author's figure per 1,000 c. ft. was a very low one indeed. In his own case at Stirling, where they were making blue water gas, the charge was much higher; but, of course, they were using good coal. He had assuredly been impressed with what the author had said in relation to the gasifying of this waste coal. He observed that Mr. Rule had now gone back from manufacturing water gas to straight blue gas; and he gave the results in the latter experiment. There was no disputing the fact that "complete gasification of coal" was a very fascinating phrase. This had been the hobby of gas engineers for a long time now; and whether it was going to be passed in one vessel or in two portions was a point that as yet was undecided. One thing, however, appeared to be certain, that to gasify coal and make blue gas they must have incandescent carbons. Once they got the incandescent carbons they must have a considerable amount of heat in order to completely change the coal into coke. It appeared to him, therefore, that for an all-gasification plant they must really have something in the nature of a combination between coking and blue water-gas plants. To his mind, it was very problematical if the present generators on the market were sufficient to produce coke in a sufficiently coked condition for the best manufacture of water gas. Various methods for the gasification of coal had been tried from as far back as the year 1890. In the experiments that had been made, he thought the one fundamental fact had been exclusively demonstrated that to produce water gas from coal effectively they must, in the first instance, have incandescent carbons. In Stirling, within the past four months, they had installed a straight blue water-gas plant, and they were now producing therms corresponding to the best results that could be obtained in vertical retorts. If it was of any interest to the members, he could give them some figures and results ranging over a period of twelve months. These figures disclosed that in Stirling they were carbonizing something like 7,800,000 therms. An output of this nature conclusively showed that they in Stirling were being brought very near to the vertical retort system.

Mr. Braidwood said he might state for the benefit of Mr. Langlands that he gave no concern at all to the question of accountancy. In Coatbridge, he troubled little with the accountancy side of the question. His main anxiety was naturally that of determining whether it would cost less or more to produce a therm. So long as the accountancy side of the problem did not affect the selling cost of the therm, he could not regard it as an insuperable difficulty.

Mr. Rule said his early experiments did not hold out any great hope that he would be successful. He decided, however, to persevere, because he preferred to fail doing something than in standing still and doing nothing whatever. A point had been mentioned by Mr. Smith as to whether there was any trouble experienced with the clinker in the generator. So far as this matter was concerned, he had to say that the clinker came down quite loosely each morning.

Votes of Thanks.

Votes of thanks were passed to the authors for their papers.

Nominations for the Council.

For vacancies on the Council the following gentlemen were nominated: Messrs. Frazer, of Dalmarnock; Killoch, of Airdrie; Munn, of Renfrew; Keillor, of Hawick; Rule, of Kelty; and Braidwood, of Coatbridge. It was announced that although the nominations were received at the spring meeting, the ballot was due to be held in connection with the annual meeting in September.

Visit to Messrs. John Lang & Sons' Works.

At the close of the meeting, the company proceeded in a body in a tour of inspection of the engineering works of Messrs. John Lang & Sons, lathe manufacturers. The company were courteously received and entertained by the Chairman and his co-Directors.

It should be added that capital arrangements for the spring meeting, which was a singularly successful one, were made by the Secretary of the Association, Mr. David Fulton.

NATIONAL ASSOCIATION OF TECHNICAL GAS OFFICIALS.

[Communicated.]

An Executive Committee meeting was held in Birmingham, on Saturday, the 2nd inst.

The question of an endeavour to form the proposed Committee to consider the conditions in the industry as they affect the technical staffs, received further consideration; and it was decided immediately to approach the Federation of Gas Employers and ask them to receive a deputation from the Association to discuss the whole question.

The amendment of the draft rules was further considered. Finally, further additional alterations and amendments were made, which will be submitted (as soon as they can be put into print) to members, for examination previous to being recommended for acceptance at the annual general meeting.

The representation of associate members at the annual meeting by delegates has been provided for, as it is recognized that very few associate members can be present at this meeting, which it is proposed should be held at the same time, and in the same town, as the Institution of Gas Engineers annual general meeting.

The division of the Association into District Sections has been made clear—each District Section consisting of the members and associate members in the particular district in question; each District Section having its own Organizing Committee, with an Honorary District Secretary.

Provision has been made for the payment of the out-of-pocket expenses of Honorary District Secretaries in the hire of rooms, postages, &c., under adequate safeguards as to economy.

The arrangement for any alteration of the rules has been brought into line with general practice, whereby all alterations must be lodged with the General Secretary twenty-one days before a general meeting, sent by him to all members for consideration fourteen days before a general meeting, and submitted by the Council to the members for voting at the meeting, and approved by three-fourths of the members present and voting, with provision for demanding a poll if members think fit.

An exhaustive report was represented by Mr. Bridge, on the Education Scheme of the Institution of Gas Engineers. This was discussed briefly; but it was felt to be of such great importance that the Secretary was instructed to submit a full copy of the report to each member of the Executive Committee for detail study.

Correspondence with the Secretary of the Institution of Gas Engineers was read, acceding (subject to confirmation) to the loan of the room used by the Institution for their annual general meeting, on Tuesday afternoon, May 24. This offer was gladly accepted; and it was resolved to hold the annual meeting of the Association at 3 p.m. on that day.

It was resolved to ask two Midland members to act as Honorary Auditors, in accordance with the rules, and subject to confirmation at the annual meeting; and Messrs. Wall and Tanfield, of Birmingham, were appointed as Chartered Accountants to audit the Association's accounts.

(Signed) F. Herbert Stevenson,
General Secretary.

MIDLAND JUNIOR GAS ASSOCIATION.

The Annual General Meeting was held in the Reading Room of the Council House, Birmingham, last Thursday, when the chair was occupied by the President (Mr. W. J. Pickering). About 45 members were present.

General Business.

The Hon. Secretary (Mr. B. J. Bell) read the annual report; and this recorded a most successful year's work.

The balance-sheet was read by the Hon. Treasurer (Mr. J. H. Gee), and some explanation was given by him and the President, particularly in relation to the items dealing with expenditure on the joint transactions.

Both the report and the balance-sheet were adopted.

A hearty vote of thanks was passed to the Hon. Secretary and the Hon. Treasurer for their valued services during the session, and for their offer to continue in office for another session.

Both gentlemen were re-elected.

The vacancies on the Council for one "Birmingham" and two "District" members were filled by the election of Messrs. J. Kendrick (Birmingham), E. Hardiker (Smethwick), and F. Cauldwell (Shrewsbury).

The President announced that the Council had elected Mr. L. H. Thomas (of the Nechells works, Birmingham) as the new Junior Vice-President.

A vote of thanks was passed to the Hon. Auditor (Mr. W. P. Timbrell) for his services in connection with the statement of accounts.

The President then called upon Mr. F. R. Ayre, Publicity Assistant, Birmingham Gas Department, to read his paper on—

PUBLICITY IN THE GAS INDUSTRY.

During the past year or two the gas industry, like all others, has been passing through a time of reconditioning and reconstruction, and attention, more or less detailed, has been concentrated first on this problem, and then on that. All over the country before the various technical Gas Associations papers have been read on a variety of subjects, principally concerned with either the manufacture or the distribution and supply of gas. To-night it is my intention to put before you a few points appertaining to a somewhat neglected, though none the less important, branch of the great industry in which we are engaged. If we except the conferences of the British Commercial Gas Association, it is rarely that we find a subject of this nature receiving its due consideration.

A few years ago a new technical journal was brought out; and among its earliest and most emphatic declarations stand out two as follows:

1.—To advertise is to educate.

2.—Charity begins at home; so should publicity.

These slogans (if one may use the word) were true enough ten years ago. They are more than ever true to-day, and I believe will become still more so in the very near future.

According to the dictionary, to advertise means "to turn the attention of others to." But we may go further than that. In addition to attracting the attention of others, advertising is letting them know that you have a commodity to dispose of that they want; and the art of advertising is so to make them realize this that they eventually come to you for what they want. The future then is in your hands. If your commodity really is what the public require, and if it is of the right quality, and supplied in the right manner to ensure satisfaction, future demand is assured. Advertising then "is notifying the public that you can supply an existing demand, and educating the public so that they will, in growing measure, demand what you can supply."

We are all familiar with some of the advertisements which grace our hoardings to-day. At the mere mention of certain commodities we are sub-consciously reminded of the advertisement of the particular article. It is on every poster station; it is in every newspaper we pick up. And why? Is it because the makers like to see their name in print, or for fun? Certainly not. It is because it pays them, over and over again. We have only to recall the advertisements on which Pears have built-up their soap business, and Macintoshes their confectionery business (to mention but two), to realize the truth of the assertion.

The question next arises—Is all this advertising and publicity necessary and profitable in the case of gas? Is every consumer in our area of supply using as much gas as he can profitably consume? Does every consumer know of the vast possibilities of gas, and its many advantages? If not, then there is room and need for publicity work. Furthermore, if the sale of gas will not benefit by publicity, then indeed it is a unique commodity. But a moment's reflection will convince us that it is both necessary and profitable to advertise gas. Just think of the public ignorance and prejudice the industry is up-against. The prejudice against gas-fires took a lot of wearing-down. Even with some people to-day it still exists. Manufacturers in pre-war days were often quite unaware of the possibilities of gas as a fuel for industrial processes. How many gas men know all there is to be known of the possibilities of gas, with its thousand-and-one uses? It is essential to remember that the public do not, and cannot, know all that the gas men themselves know, unless effective steps are taken by the industry to teach the public. We in the industry are for ever learning something new as to the wonderful possibilities of the commodity with which we have to deal; and it is up to us to pass on this knowledge to the public by advertising and publicity, remembering all the time that to advertise is to educate.

At this point it may be well to look at the question of publicity in the industry in a general manner, and we may divide it into three periods—viz., pre-war, war, and post-war.

The Pre-War Period.

Although the gas industry has attained a ripe old age, it may be said that it is only within comparatively recent years that publicity has commenced to receive attention. I say commenced, because even to-day it is receiving nothing like the attention it undoubtedly must receive. In the good old days there was far too much of the "take it or leave it" attitude about most undertakings, and very little trouble appears to have been taken as regards consumers. Such methods would never have carried any industry far; but fortunately a rival appeared on the scene in the shape of electricity, and according to the electricians gas was doomed. The development which has since attended our industry is too well known to need emphasizing here; but I am inclined to think that without the electrical competition gas would not have reached its present position in the domestic and industrial world. With the coming of competition came the spur to increased effort. The introduction of the Welsbach mantle had revolutionized gas lighting; and continual investigation was being carried on as to the possibilities of gas for other purposes, such as cooking, factory use, and domestic heating. Developments in these various directions brought into being new firms for the manufacture of the necessary gas-consuming appliances, and to them was largely left the advertising of their wares. Their main object was to sell their particular make of gas burner or cooker, as the case might be, and the sale of gas was a very secondary consideration in their eyes. Co-operation in those early days was almost non existent; but towards the end of the 19th century, indications were not lacking that it was beginning to creep into business relations, with the result that occasionally a firm manufacturing gas-appliances would, in conjunction with the gas undertaking in a populous area, undertake a joint advertising campaign. This was almost a local campaign—rarely did it reach what we to-day understand as a "district," while national adverising campaigns were unknown in the industry. During a period of boom, such as the cooker boom, manufacturers were mostly left to carry on their advertising in their own way. With the dawn of the 20th century, and increasing competition, business methods became keener and new ideas came into play. A big move forward was noticeable in advertising generally, and business houses began to look upon it as a business necessity; but still the gas industry as such was, on the whole, inclined to hold aloof. Occasionally an undertaking would make a display at some local exhibition or perhaps insert an advertisement in a local newspaper, but I find no record of anything of a national character

Competition from the electrical industry becoming keener and keener, the industry slowly began to realize that it was high time something was done from the point of view of the industry as a whole to improve matters. After much discussion, and with the support of the gas-appliance manufacturers, 1912 saw the birth of the British Commercial Gas Association, to preach the Gospel of Gas. The most important work of the Association is in connection with publicity in its many and varied forms. It was soon apparent that the "B.C.G.A." was meeting a much-felt want; and gas became a new subject of national advertising, the results of which were indirectly felt by undertakings all over the country. The "B.C.G.A." was getting well into its stride when war broke-out, with which may be said to end the first period of publicity in the gas industry.

The War Period.

The publicity of the war period eventually assumed a very different aspect from that suggested by previous arrangements. Very few people in this country at the outset realized the stupendous task on which the country had entered, and we can all recall the parrot cry of "Business as Usual" which was heard on all sides. With the continuance of the war, its increasing seriousness, and the ever-growing demands for men, it was soon realized that business could not go on as usual, and attention was directed to the conservation and utilization of the national resources. It then became a matter for the industry not so much of getting new consumers to use gas, but to see that existing ones used gas in the most economical and efficient manner. The "B.C.G.A." then proved to the industry the value of its existence. Particularly through its publication "A Thousand-and-One Uses for Gas," it was able to render to gas undertakings, and through them to gas consumers, services of a particularly noteworthy character in directing the attention of all and sundry to making the best use of gas, consistent with individual needs and national requirements. Publicity work of this character was indeed a valuable asset to the industry, which was thus brought favourably and prominently to the notice of eminent men who had hitherto heard of it in a very general way, but knew nothing of it intimately. This work

was undoubtedly of the greatest value to the industry, though the real significance of it cannot at present be estimated.

The Post-War Period.

Dealing with this question of gas publicity is almost entirely a matter of conjecture. With the signing of the armistice, the thoughts of manufacturers were turned to reconstruction work, and the anticipation of getting back to pre-war conditions. How far realization has fallen short of anticipation we know only too well. In our own industry it was anticipated that now we should be able to push for business in directions which had been closed to us during the war period. Munition work had naturally taken prior place as regards the supply of gas in war-time, and domestic consumption had had to get along as best it could in the prevailing circumstances. With the slackening-off of the manufacturing demand, there would be a fine opportunity for developing the sales of gas for domestic purposes, such as gas fires, geysers, and gas-heated circulators for the provision of hot water, gas-heated coppers for washing purposes, and so on. Unfortunately the coal situation so far since the armistice has been such that pushing for business has been entirely out of the question, and there have been endless difficulties to contend with. Still, we live in hope; and when we are able once more to go ahead, we can look to these channels for an almost unlimited extension of business, to say nothing of the innumerable new forms of industrial demands for gaseous fuel—the result of war-time experience.

Thus far I have in a very sketchy manner referred to the broad outlines of publicity in our industry. A few points in more specific detail may not be out of place.

Advertise Simply and Frankly.

The gas industry is naturally out to get the greatest sale per consumer it possibly can. It does not necessarily follow that this will be where gas is cheapest. Gas will not sell itself, whatever the price. It needs, in addition, good service; and good service implies the best of relationship with the consumer, so that he can get the best out of the commodity that we have to supply, and in the most efficient and economical manner. To bring about this good relationship it is necessary that the public (or customers) should have a thorough understanding as to the problems of our business. The best way to bring this about is by advertising—advertising simply and frankly, or it will be of no avail. The industry must be prepared to tell its consumers the whole truth about its business. As an industry it is in a unique position as regards the commodity it has to sell; and unless it is prepared to stand the light of public inquiry it cannot expect to progress. We must advertise by every possible channel and hit hard—all the time being strictly accurate. By such methods will it be possible to convince consumers that gas undertakings are trying to do their best for the general good, and that it is in the consumers' own interest that they should support the industry as far as they can.

Methods of Advertising.

There are three main classes of advertising:

1.—National. In publications with a national circulation—*e.g.*, "Punch," the "Strand," and similar magazines, the Technical, Professional, and Trade Press, the great "dailies," &c.

2.—District. Mainly in papers which circulate in certain large areas of the country, such as the "Birmingham Post" in the Midlands and the "Manchester Guardian" and "Yorkshire Post" in the North.

3.—Purely Local. In the local press, programmes, church and similar magazines, on hoardings, in tramcars, on theatre screens, by district showrooms, &c.

It is only natural to ask how this advertising can best be done. Can the necessary publicity be best obtained by local, district, or national effort? Undoubtedly all these methods are needful, in that they are supplementary to each other, and each adds to the value and effect of the others.

I do not intend to deal with the first two of these methods. They are entirely in the hands of the "B.C.G.A.," the work of which is too well-known to need detailing here. The funds subscribed by the supporting undertakings permit of the Association conducting these co-ordinated campaigns and enables the gas undertaking to conduct its local publicity far more effectively and economically than it could possibly do otherwise. The national advertisements of the "B.C.G.A." are continually sowing seed in the minds of the public in every corner of the country. Local enterprise waters the plant and reaps the harvest. The more progressive the local undertaking the greater the harvest from the seed; and even the least progressive undertaking, in spite of itself, gets some advantage from the sowing.

Local Advertising.

On the question of purely local publicity work, it is here that I think much more attention is required from gas committees and boards of directors. On the general lines of seasonable advertisement in the local press, in church magazines, on various programmes of meetings of all kinds, and on the local hoardings, no doubt most undertakings are to some extent looking after local advertising. But is this enough? Are gas undertakings making the most of their employees—from the Chief down to the latest-joined boy—as regards this question of publicity? Is every employee of the undertaking using gas to the best advantage? The more practical the publicity, the more far-reaching its effect; and I do not think too much attention can be given to the individual employees. Take certain classes of employees, particularly those who come into touch with the consumers, such as gasfitters, &c. Would it not be worth while if the undertakings were to help these men in a practical way and see that they were equipped with appliances to use gas constantly for all purposes? If gas will cook and heat economically, surely the men who are supposed to understand its uses so thoroughly would be able to utilize it to better advantage than the general public. I think it would pay gas undertakings to encourage such employees to use gas for all purposes by letting them have their gas at a little over cost price. There is nothing like personal experience; and by encouraging it the gas undertaking would undoubtedly gain. Each individual employed by a gas undertaking should be an enthusiast for gas, and a constant advertiser of it; and a little practical sympathy from the undertaking will go a long way. This is particularly so in a big concern, where the duties of the different employees have of necessity to be exceedingly "sectionalized." A man may then be dealing continuously with a certain type of work which is but a portion of the whole, and his outlook and ideas tend to get confined and restricted. Local publicity to my mind should include a system whereby such individuals are from time to time given the opportunity of seeing other aspects of the question by an occasional visit to the works to see new plant, or by a visit to the showrooms to inspect new and more up-to-date gas-consuming appliances. We have only to consider the view of the man in the street to realize the necessity of this. Conversation at some time or other turning upon matters of gas, a question arises on which advice is wanted, often of a very simple nature, and one man says "I'll ask Jones; he's with the gas company." Now the odds are that the bigger the undertaking that Jones is working for, the less likely he is of being able to answer the question, for the simple reason that his job is very clearly defined and that he never goes outside its bounds. Particularly should this opportunity of looking round be given to all employees who come into contact with the consumers, that is meter inspectors, fire and cooker attendants, burner cleaners and the like. To the consumer generally, these employees are not as we inside know them. They are the "gas men" to the consumer; as such he regards and questions them; and it is from this point of view that I would urge the consideration of this suggestion. The future of the industry will depend to a much greater extent than ever before on our relations with our consumers, and it behoves the industry to make the most of the employees, therefore, whose daily duties bring them into intimate contact with the public.

Showrooms are a very general form of local publicity. Opinions as to their relative importance vary greatly. Personally, I would prefer to see show-houses. Often a gas showroom appears to be a jumbled mass of gas fires, cookers, pendants, and other apparatus, and only as such does it appeal to the consumer. A show-house with gas installed in the proper places for all purposes is much more effective; and the consumer can then see the appliances in their proper setting. I quite realize that show-houses would necessitate furniture and other fitments outside the dealings of a gas undertaking, but I do not think this would necessitate extra expense. Rather do I think it would provide for co-operation in publicity, as different firms concerned would doubtless appreciate the chance of showing their own goods in an attractive manner, and would be prepared to share expense. Expense is a big factor in regard to showrooms; but it must be treated as an expense in relation to the business it brings. In this light the argument that only the big undertakings can afford to advertise in this way, loses a lot of weight. Of course, the best type of showroom is one that admits of model rooms, kitchens, bathrooms, &c., being laid-out as such with alternative types of the different appliances in close proximity to allow of the consumers' inspection.

Exhibitions are often another feature of local publicity. To my mind they should be a very pronounced feature, particular attention being paid to the type of exhibition (*i.e.*, if it is to be what is generally known as a popular exhibition, or a trade exhibition, or a health exhibition, &c.), with exhibits arranged to appeal accordingly to the visitors. Exhibitions offer a fine ground for co-operative advertising, and in return for gas-fittings, gas-fires, &c., loaned to (say) a furniture manufacturer for a model house display, a certain amount of material would doubtless be forthcoming to assist in the completion of the gas exhibit. The more this co-operative spirit can be introduced into this type of publicity the greater the return; for if a visitor, in his tour of the exhibition, is constantly seeing gas-appliances in their proper position, the appeal will be so much the stronger than if he had only noticed them at the gas company's stand.

Another exceedingly good idea in local publicity is the use of "stickers," as the Americans call them—adhesive slips advertising the use of various gas-appliances appropriate to the varying seasons of the year. One is sent out with every gas bill, letter, &c., leaving the undertaking. This is a most effective form of publicity.

New Business.

It is to new business that the industry has to look for its future development. By new business I do not mean new consumers—rather do I mean the getting of increased consumption from the introduction of new appliances into existing consumers' premises. In this connection the gas man to whom I have previously referred is a most valuable agent, and should be encouraged (by the offer of a slight pecuniary reward if need be) to be on the look-out for new business. Some such system obtained in the Birmingham Gas Department in pre-war days.

It is not my intention to go into the details that go to make up advertisements, such as copy-writing policy, space, design, lay-out, &c.—all points which in themselves would each furnish matter sufficient at least for a paperette; but I think sufficient has been said to show that it is essential to realize that the future success of the industry is indissolubly bound-up with the success or otherwise of its publicity. The gas industry has been a long while waking-up to the importance of advertising and its potential value. Realization is growing, though we are still a long way behind our friends in America. The "B.C.G.A." can be trusted to do their part as regards the national and district publicity; but the final word must be with the local undertaking. Without their assistance the work of the "B.C.G.A." is wasted. With it, it can become invaluable, particularly if it is backed-up by judicious local publicity.

Advertising is far from being a simple thing. It has been described as a combination of science, art, and mystery. On the one hand it touches such a concrete thing as typemetal; at the other extreme it enters into the abstract psychology. That it is not a simple matter is at once apparent on but a superficial consideration of some of the points to be dealt with as the result of a decision to advertise. It is then necessary to consider policy, finance, the commodity, the market, and the consumer, co-ordination with sales organization and the progress department, the relationship with other publicity methods, the question of the form of the advertisement and its line of appeal; and then there are the practical considerations, such as preparations of copy, photographs, blocks, printing, type, &c. Even to-day publicity managers are rare except in the most progressive and up-to-date firms, where publicity is recognized at its true worth, as the result of positive proof from past results. How can effective publicity be expected when, as is often the case, the whole of the publicity work is being left to the manager or other chief official, who has to squeeze out odd moments from his other pressing duties, or shunt the job on to a subordinate?

The best manufacturers of the world are to be found in this country, and the best salesmen in America. Why is this? Possibly because the marketing side of business has not received in this country the same amount of assiduous and detailed attention as the manufacturing. The American on the other hand has studied marketing and distribution. In the end it is the best salesman and not necessarily the best maker whose goods are most largely consumed. That the public buys most readily and largely what it knows best has been proved again and again by manufacturers who have made known their goods to all and sundry by national advertising. Manufacturers are realizing that a closer relationship is necessary with the consumers of their products and that this closer relationship must be developed by publicity. This is equally true of the gas industry, which has got to adopt progressive business methods to ensure future success. Publicity is undoubtedly one of the foremost of these. Then, if publicity is backed-up by good service, there is no limit to the future possibilities of gas.

DISCUSSION.

The President, in moving a vote of thanks to Mr. Ayre, stated that the subject had been dealt with in an interesting and logical manner. The present was an age of advertising; and the importance of advertising could hardly be exaggerated. But it was of the first importance that the truth should be told. A business undertaking must stand the light of public inquiry if it was to be successful.

Mr. R. J. Rogers (Fittings Superintendent, Birmingham Gas Department) pointed to the importance of the subject of advertising, and directed attention to the fact that it was receiving more consideration at the hands of administrators in the gas industry. At one time advertising was considered almost *infra dig.*; and many gas engineers poohpoohed the idea of the industry going in largely for a gas advertising campaign. People of this kind were becoming more scarce; and to-day it was generally agreed that advertising was necessary if they were to bring the commodity and the means of using it to the notice of consumers. It was important that they, who were engaged in the gas industry, should recognize how great was the amount that was spent on publicity by large manufacturing firms. If it were well, artistically, and judiciously done, there was no doubt that it paid, and paid well. There were still gas undertakings that were prepared (as he thought, unfairly) to reap the advantages of the co-operative system of advertising gas without paying their quota towards the cost involved. Gradually the non-contributing concerns were, as they were becoming more enlightened, being brought into the fold; and it was a matter for satisfaction that the progress of the "B.C.G.A." in this connection had been phenomenal. The percentage of subscribing undertakings was now large. "We want," said Mr. Rogers, "every gas concern to be identified with this movement; and let me say that in such an institution as ours, it is really of the first importance to the smaller gas undertakings, because they are not able themselves—on the ground of expense—to produce a variety of booklets, pamphlets, and reprints of special articles, &c." Until the advent of the "B.C.G.A.," this sort of thing was, he pointed out, restricted to the largest undertakings. But now the advantage of such advertising was common to all; and therefore the scheme should be supported by all. ["Hear, hear."] As to the suggestion that gas should be supplied at a little over cost price to employees in gas undertakings, while it was true that something in this direction had been done by some concerns, it would appear doubtful if such a proposal would find favourable acceptance by municipal undertakings, where the number of employees was very considerable. He agreed that it was most important that every man engaged in connection with a gas undertaking, no matter his position, should be conversant on general lines with what gas could do. From experience, they knew that the meter inspector was looked upon, when entering a house, as the representative of the gas undertaking; and it was really surprising how much the inspectors were expected by consumers to know. This showed the necessity for educating all the employees who came in contact with the public. It was not, of course, considered that they should have expert knowledge, but more could be done, with profit to the industry than was now done, on the educational side. In this connection, it was hoped that useful information might be imparted to the employees of the Birmingham Gas Department through the medium of their "Magazine." The speaker then touched upon the importance of show-houses and show-rooms. Cases might be cited, he said, in which undertakings had acquired or built show-houses, which, by arrangement with the local furnishers, were fitted-up with a variety of gas fittings and apparatus. The Birmingham Gas Department were completing arrangements with two estate companies for show-houses—one in the Kings' Heath district and another in the Hall Green district—whereby they would agree with the owners of the houses for an adequate display of gas-fittings and general equipment in its true setting. The object was, of course, threefold: To give prospective house buyers a good opportunity of seeing the kind of house they desired; next to enable them to have demonstration of how furniture could be best and most economically arranged; and, thirdly, to bring home to the public the great possibilities of gas in domestic use. To his mind, it was an excellent method of soliciting business. He was satisfied that gas was not used nearly so much as it ought to be in the home; and it seemed essential therefore that much more would have to be done on the publicity side. There were two forms of advertising—good and bad. An advertisement did not end with the notice in the paper, however attractive it was made. Whether the advertisement was good or bad would depend upon the service which was rendered to the consumer by the gas undertaking in the equipment of premises with the proper type of appliances and then satisfactorily maintaining them. In a sentence, advertising was rarely of little value unless it was backed by good service.

Mr. W. Batt (Newcastle) said, in his judgment, advertisements respecting gas use or gas appliances should "hit hard," and should be large and effective. But good as advertising was, the undertaking itself afforded the real advertisement—by efficient and clean workmanship in the private house. Exhibition houses had recently been provided in Newcastle in conjunction with estate owners and general furnishers. It had not been an expensive experiment; and so far it had been thoroughly justified. Large numbers of persons visited the houses, and inspected with interest the many forms in which gas could be used in the home.

Mr. H. R. Hems (Industrial Research Laboratory, Birmingham) observed, with regard to the use of gas for power and industrial purposes, that a good deal of prejudice against its use on the part of workmen had still to be overcome; and he thought this prejudice might be considerably reduced by publicity methods followed by practical demonstrations.

Mr. B. J. Bell (Birmingham) commented upon the importance of advertising on national lines, because it prepared the way for effective local propaganda work. A difficult aspect was that, when they advertised gas, they frequently advertised indirectly a maker's apparatus; and he could not help thinking that business did not result in many instances because much of the apparatus on the market was rather too expensive. It was the cost of installation that deterred many persons; and it seemed to him most desirable that closer regard should be had for the spending possibilities of the bulk of working-class gas users. Water heating apparatus afforded an encouraging field; but he had not the slightest doubt that demand would be enormously increased if first costs could be reduced. It seemed to him that the public were not adequately informed as to the causes for the increase in the cost of gas, or as to its economic uses compared with other forms of fuel or lighting. He believed the "all gas" house would do much to popularize the use of gas, and that the "show houses" would prove an excellent investment.

Mr. S. W. Simmons (Dudley) insisted that, if advertising were to be a really paying proposition, there must be an effective "follow-up." A reliable service with good clean workmanship was the best advertisement that could be had.

Mr. Luke Sturdy (Birmingham) urged that there was no need on gas bills for a lot of legal jargon, and suggested that they might with advantage be made to serve a publicity purpose. Why not have displayed on them, he asked, drawings of the various types of fittings or apparatus a department had to sell?

The vote of thanks was unanimously passed.

Mr. Ayre, in his reply, emphasized that, however well gas advertising was done, it had its limitations; it must be backed-up by good service. And such service was specially necessary as gas consumption was a continuing thing. It was quite different from a transaction in which a thing was bought outright. It was quite true that in advertising gas use, on certain lines, an indirect advertisement was given to some form of apparatus; but it had to be remembered that the purchase of the latter consisted of one transaction, while gas consumption was continuous. Gas undertakings were, in his judgment, doing the right thing in extending hiring schemes. He was strongly of opinion that we have much to learn from America in advertising and salesmanship.

RAPID WATER HEATING IN BULK BY GAS.

Great Advantages of this Fuel for Sports Pavilions.

The demands of a sports pavilion in the matter of hot water are for a large quantity during a short space of time; and therefore it would seem that gas must be by far the best fuel that could be selected for the purpose of providing this water on the one or two afternoons a week when it would be wanted. There is no stoking of furnaces for hours and hours before the water is needed—no labour, in fact, of any kind—and there is no waste of fuel during a lengthy cooling-down of the plant after the hot water has been furnished. Starting-up is effected merely by the turning-on of a few burners; and the reversal of this

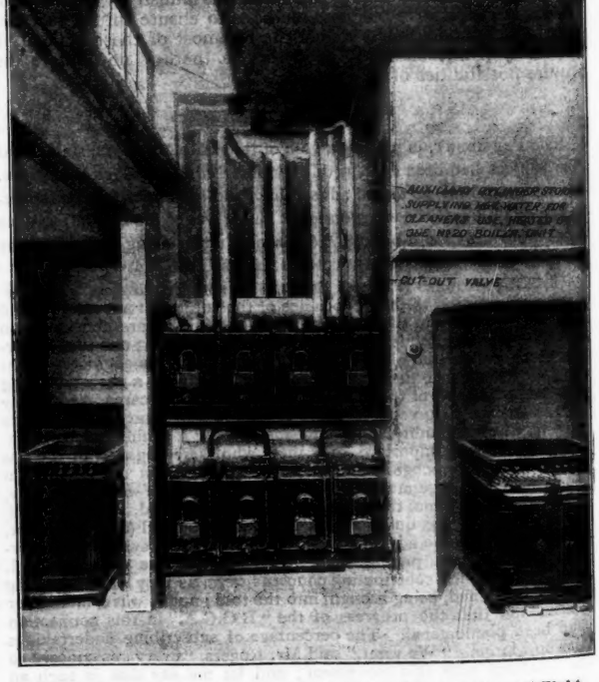
THE ATHLETIC PAVILION AT BECKENHAM.

simple little operation is all that is called for as soon as the heating of the water has been completed. There is also the question of space to be considered, as compared with the employment of solid fuel. These considerations led the writer confidently to anticipate seeing a highly successful installation when visiting recently (at the invitation of Mr. S. B. Chandler, of the Sales Department of the South Suburban Gas Company) the Athletic Pavilion at Beckenham of the London Joint City and Midland Bank, Ltd. This confidence proved amply justified. The facts of the case are set forth in some fullness here, in the hope that they may prove of assistance to the sales departments of other gas undertakings in following-up business of a similar character.

The part of Beckenham in which is situated the handsome pavilion just erected (to the design of Mr. Edward A. Stone, F.S.I., of No. 131, Regent Street, W.) by Messrs. Holloway Bros., Ltd., for the London Joint City and Midland Bank, Ltd., is greatly favoured by athletic clubs; and there are many sports pavilions in the neighbourhood. Thus it may reasonably be hoped that there will be a following here, as elsewhere, of the good example that has been set by what is considered to be one of the finest pavilions in England. Of the building itself, and the surrounding facilities for all manner of out-door sports, all that there is opportunity to say here is a word of praise for the architect who has designed what would appear to be a perfect sports pavilion, and of congratulations to the staffs (both male and female) on whose behalf such magnificent means of recreation have been afforded by the bank in question. To turn now to the aspect of the matter with which "Journal" readers are most closely concerned, it may be said that solid fuel had been arranged for, to give the general hot-water supply and for warming and wash-house purposes; and a boiler-house was designed and included in the original specification. As the result, however, of considerable negotiations between the architect and the Sales Department of the South Suburban Gas Company, a scheme was submitted for hot-water supply by means of gas-heated boilers, and warming with gas steam-radiators. This scheme received consideration, and was approved by the architect; and the whole of the Gas Company's recommendations have been adopted.

It must be clearly understood, as being the very essence of the thing, that the requirements of the Club for hot-water service are abnormal, inasmuch as, when games terminate, a very large number of players desire hot water for ablution purposes all at one time. As a matter of fact, when the two plunge-baths and the lavatory basins are in use, about 1000 gallons of high-temperature water are required for these purposes. The necessary hot-water plant has been installed, on behalf of the Gas Company, by Messrs. Potterton, heating engineers, of Balham, whose name is well-known in connection with installations of this character. It consists of two batteries each of eight No. 20 "Victor" boilers, coupled to two 600-gallon hot-water tanks, from which are laid the draw-offs for two sunk plunge-baths (each 10 ft. by 6 ft. by 2 ft. deep), and two ordinary baths, besides forty lavatory basins, and five sinks.

For the purpose of supplying a small quantity of hot water for mid-week domestic usage—*i.e.*, the washing of floors and general cleaning—a cylinder of 30 gallons capacity has been connected to the plant, in such a manner as will permit of one boiler being cut-out from the battery to actuate this small plant. For occasions when even less than 30 gallons of water are required, a



Boiler Plant of the Kitchen Section: Comprising a Battery of Eight "Victor" Boilers, also Showing part of the Cooking Equipment.

cut-out valve has been fitted to the cylinder—further reducing the quantity to about 10 gallons. This most useful adjunct to gas-heated apparatus was invented and patented by Mr. Thomas Potterton as far back as 1904, and has done much to make possible the economic use of gas as a water-heating medium. At the rear of the boiler-house is a drying closet; and to warm this, the hot-water tank has been placed in the wall separating the two chambers, so that while the boilers are in action the linen room is warmed by the hot-water tank, which projects some 18 in. into the room.

A feature of the installation is the excellent lagging of the flow and return pipes, secondary circulation, and tanks, with the result that the service is both speedy and highly efficient, as the subjoined details of a carefully-taken test will show.

Test taken Feb. 19, 1921.

Cold water 48° Fahr. at the tap of the jacketed hot water storage tank at the commencement of the test.

One apparatus consists of 600 gallons of water in tank
48 ,, ,, ,, ,, eight boilers
22 ,, ,, ,, ,, piping.

670 gallons in all.

One apparatus consists of 600 gallons of water in tank
30 ,, ,, ,, ,, cylinder
48 ,, ,, ,, ,, eight boilers
32 ,, ,, ,, ,, piping.

710 gallons in all.

670 gallons raised from 48° to 143° = 95° rise } Average increase
710 ,, ,, ,, 48° ,, 145° = 97° ,, } 96° Fahr.

Therefore 670 × 10 × 95° = 636,500 B.Th.U. produced.
,, 710 × 10 × 97° = 688,700 ,, ,,

1,325,200 B.Th.U.

Gas consumption shown on meter at 12.23 p.m. = 58,300
,, ,, ,, ,, ,, 3.23 ,, = 61,750

Difference = 3,450 c.ft.

1,325,200 ÷ 3450 = 384 B.Th.U. per cubic foot of gas consumed.
Consumption of gas = 2·5 c.ft. per gallon.
Thermal efficiency = 76·8 p.ct.

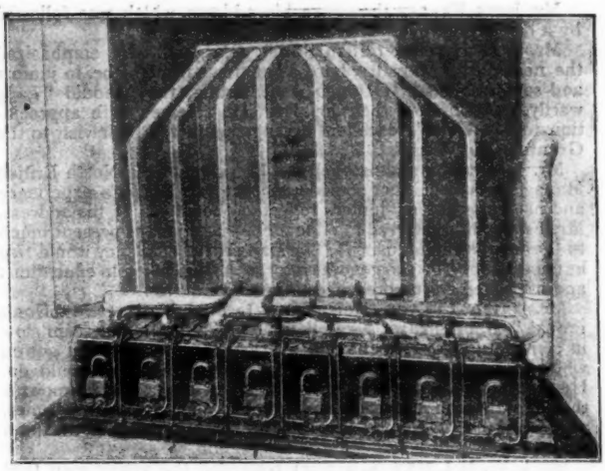
It should be noted that the efficiency of 76·8 p.ct. recorded in the above test is the temperature at the taps, and is after providing for all losses in heating, circulating, storing, and delivering the water.

With the high thermal efficiency shown by this test (which was taken under ordinary working conditions), in addition to the advantages pointed out earlier in this article, the installation certainly affords a striking example of the general utility of gas for water heating on a large scale; for if a plant of this capacity can operate with so high an efficiency, smaller requirements in proportion can be fulfilled equally well. The hot-water supply is much appreciated by the Club officials, as well as by the users.

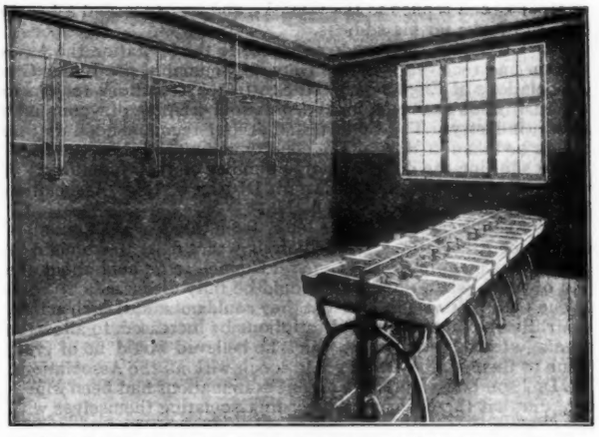
The general heating of the pavilion is accomplished by means of 29 Arden-Hill gas-steam radiators of various sizes, installed in the concert room, billiard room, dressing rooms, committee room, staircases, &c.; and it has been designed to produce, when required, an equable temperature throughout the building.

For cooking, there are in the main building a special Arden-Hill and two Parkinson gas-cookers, together with hot-water apparatus for tea making in the refreshment room. An Arden-Hill 25-gallon "Rotunda" wash-boiler is fixed in the wash-house; and in the private quarters (occupied by Captain Busby, D.S.O., the Steward of the Club) have been fitted a Parkinson gas-cooker, geyser, and gas-fire. The cooking apparatus in the groundsman's cottage is also a Parkinson gas-cooker; while hot-water is obtained by a geyser in the bath-room.

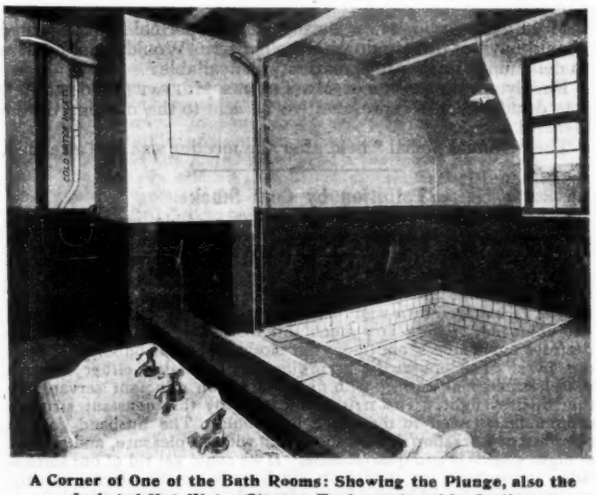
There is a 4-in. service laid into the boiler-house, and thereto are connected meters of 150-light and 200-light capacity, serving the building. A 3-in. cold-water supply main rises through the building into the roof, feeding a 1000-gallon tank, which supplies the whole of the building.



The Boiler Plant Fitted in the Heating Chamber; Showing also the Back of the Hot-Water Storage Tank, which is Applied to the Heating of the Drying-Room Adjoining.



A Corner of One of the Four Bath Rooms: Showing the Lavatory Basins and Showers.



A Corner of One of the Bath Rooms: Showing the Plunge, also the Jacketed Hot-Water Storage Tank serving this Section.

SCOTTISH JUNIOR GAS ASSOCIATION.

(WESTERN DISTRICT.)

At the close of the seventeenth session of the Association a general meeting was held in Glasgow on Saturday, the 2nd inst. as already noticed in the "Journal." A valedictory address was delivered by Mr. John Frazer, the Manager of the Dalmarnock Gas-Works, Glasgow. This address was printed in our columns last week [p. 81]; but it is regretted that the remainder of the afternoon's business cannot be given in full. A letter from our reporter was received, from Hamilton, which, as our readers know, is in the thick of the trouble in Scotland. He regretted that the prevalent disorganization had prevented his attendance at the meeting, and that the unusual demand for reporting had made it impossible to find a substitute. We have since received from him, however, some notes, from which our abbreviated report has been compiled.

Mr. James Jameson was in the chair. The annual report showed that there were 38 new members of the Association, and that 11 had been struck off the roll. A total membership of 221 included 2 patrons, 28 honorary and 191 ordinary members—an increase of 12 over the previous year.

The balance-sheet showed a sum of £26 3s. 10d. to be carried forward.

The office-bearers are as follows: Mr. J. Cubie, President; Mr. W. J. Lennox (Falkirk), Vice-President; Mr. Munro (Milan Street), Secretary and Treasurer; members of Council—Messrs. G. Carr (Dumbarton), T. Orr (Ayr), J. M'Isaac (Milan Street, Glasgow), R. Struthers (Motherwell), T. Workman (Dalmarnock, Glasgow), and J. S. Elder (Provan, Glasgow).

Mr. John Frazer then gave his address, which was followed by a discussion, opened by

Mr. S. H. Hunter (Milan Street, Glasgow). He emphasized the necessity for loyalty, hard as at times it might be, in juniors and seniors alike. If things went wrong, they should "gang warily," and uphold their loyalty. He referred with appreciation to Mr. Cubie's excellent arrangements for their visit to the Granton Gas-Works.

Mr. J. Dickson (Johnstone), the President of the North British Managers' Association, considered that Mr. Frazer's experience and his work among juniors reflected the ideals of his address. Mr. Frazer had referred to education—a subject at present much to the fore in the industry. The standard of efficiency would rise in consequence of the general interest being taken in education; and improved status preceded improved salaries.

Mr. David Fulton (Helensburgh) would like to add "Don't grouse" to Mr. Frazer's excellent list. Things might seem slow in coming, and one might feel overlooked; but the man got on who worked and did not talk—especially of what he could do. His short experience of managership had acquainted him with the assistant who threw cold water and compounded airy schemes, and with the agreeable, loyal man. The latter was the man whom the manager assists into a better job.

Mr. J. W. M'Lusky (Glasgow) reminded the young men that they had no real grievance at receiving less remuneration than the practical workman. The latter had no prospects. Let the juniors be content to sacrifice something in return for their prospects.

Mr. Frazer replied to the remarks, and was accorded a hearty vote of thanks for his address.

The Chairman then made reference to the invitation the Association had received from the General Council of the Junior Gas Associations of England for the Scottish Associations to join in the Institution's scheme for the practical training of young men in the industry. The Council had at first recommended that no action be taken in view of the conditions suggested by the Institution shutting the door to a large number of their members. A recent discussion with the Eastern District of their Association had confirmed this recommendation.

The Secretary then read a letter from the General Council of the Junior Associations strongly urging that delegates should be sent to the meeting of the General Council to be held about the end of April, when the matter would be fully discussed.

The Chairman remarked that they could not afford such action.

Mr. Fulton urged that subscriptions be increased, to allow the sending of a representative, which he believed would be of great value to them. They must get in touch with all the Associations. Mr. Dickson had assured them that examinations had been wiped-out, and that there was no danger in associating themselves with the scheme.

Mr. Dickson confirmed the wish of all on the Institution's Sub-Committee on Education that examinations should be abolished. He thought that their way was now clear for joining the General Council.

Mr. Frazer said it was strange the people chiefly concerned should have so little to do with the matter. Would it not be wise to delay until further information was available?

Finally, on the motion of Mr. Thomas Moffat (Tradeston), it was decided that a representative be sent to the meeting of the General Council.

The "Annual Social" held after the meeting was well attended.

Pollution by Coal Smoke.

In a letter to "The Times," dealing with possible improvements to the appearance of London, Mr. Ernest Newton, architect, urges that to get rid of coal smoke is the first thing to be done; it is the one great blight on every effort for improvement. He says: "Pillar-boxes, sand-bins, and lamp-posts may be 'dreams of beauty,' but if they are disfigured by a sooty leprosy, their beauty will leave us cold and unmoved. Think how much this distressing atmosphere, which destroys our tempers, our lungs, our clothes, and our buildings, affects our lives. The housewife, according to her station, either wages a ceaseless personal warfare with dirt or urges on reluctant servants to the hopeless fight. The irritation caused by this constant struggle communicates itself to the whole household. The husband goes to his office or workshop depressed, works without pleasure, and returns at night spiritless and quarrelsome. If we could get rid of our smoke-laden atmosphere, we should do much to solve the eternal servant question; we should have a happy instead of a grumpy population; we could paint our houses, knowing that they would not run sooty tears at the end of a week; make the most of what is already good in the lay-out of our great city; and gradually proceed to higher flights and more ambitious efforts. Until this is done, how can we expect people to have the slightest enthusiasm either for London as it is or as it might be? And it is this enthusiasm and desire for a beautiful city that is the first essential. No Committee of Taste, or any other body, can do much until they can count on the intelligent support of the community. Many parts of London are admirably laid-out, with good streets, gardens, and quite tolerable houses; but over all is the perpetual pall of smoke, eating away paint and cement, corroding metal, and covering everything with a coat of black slime. The present condition of many districts is deplorable—cement peeling off, paint hanging in rags, and houses assuming a mournful, hopeless appearance.

The Lanark County Council are promoting a Provisional Order, to authorize them to purchase the undertaking of the Bothwell and Uddingston Gas Company, Ltd.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

A German Discovery (!).

Sir,—The abstract translation of a paper recently read by Herr L. Stock [see "Journal" for March 30, p. 804] seems to trespass very much on past history and experience, in connection with English gas-works carbonizing practice. The originator of the Goffin process, as described by Herr Stock, has "discovered" nothing relating to carbonization that has not been common knowledge extensively applied, dating from the introduction of the push-pattern discharging machine, which dispenses with the necessity for a sufficient clearance above the charge to allow the travel of a raking tool. The only novelty connected with his process and methods is the arrangement of the low-pressure boiler at the back of the furnace.

I do not propose to go fully into claims for priority of "discovery" in carbonizing methods and practice. The results of experiments made by myself at the Exeter Gas-Works many years ago, to which I have lately referred in the articles, "Carbonization in 1900 and in 1920," proved that the penetration of heat through the charges in horizontal retorts varies in upward and downward directions, according to the thickness of the charge and the void space above it; and that in designedly reducing the length of travel and the exposure of the gas to the influence of high temperature, the penetration of the heat could be rendered more nearly equal, and the quality of the gas greatly improved both in respect to candle power and calorific value. The fact stands good to-day that, if horizontal retorts did not exceed 3 ft. to 4 ft. in length, all that is best would be obtained from the coal put into them; but for obvious reasons this short-circuit construction has not been adopted.

Thos. Settle.

Postbridge, Devon, April 4, 1921.

REGISTER OF PATENTS.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for April 6.]

Nos. 9215 to 9836.

Blumner, E.—"Process for the continual distillation of tars or oils." No. 9361.

Bonnard, L. H.—"Carbonizing furnaces or retorts." No. 9646.

Brighton and Hove Gas Company.—"Grabs." No. 9474.

Burton, A. E.—"Gas-retort mouthpieces." No. 9500.

Dobson, E.—"High-pressure gas-governors." No. 9523.

Foster Engineering Company, Ltd.—See Dobson, E. No. 9523.

Frentrup, H.—"Process for obtaining valuable components from brown coal, slate, &c." No. 9488.

Graefe, P.—"Apparatus for purifying air, gas, or vapour." No. 9353.

Jackson, A. H.—See Burton, A. E. No. 9500.

Keith, G.—"Heating and drying apparatus." No. 9761.

Krogh, S. A. S.—"Recording analyzing apparatus for automatic analysis of gases." No. 9560.

Laing, B.—"Treatment of gases or vapours, &c." No. 9653.

Marshall, H. G.—"Gas-burner for kindling fires." No. 9594.

Meyer, H.—See Frentrup, H. No. 9488.

Nielsen, H.—"Treatment of gases or vapours, &c." No. 9653.

Pedersen, P. H.—See Krogh, S. A. No. 9560.

Rigby, T.—"Heat-regeneration systems of gas-producer plants." No. 9778.

Schroeder, F. W.—"Globes for gas-burners." No. 9309.

Schubert, Geb.—See Frentrup, H. No. 9488.

Soc. L'Air Liquide, Soc Anon. pour l'Etude et l'Exploitation des Procédés G. Claude.—"Synthesis of ammonia." No. 9382.

Ward, J. F.—See Laing, B. No. 9653.

Williams, I.—"Measurement of small pressure differences in gases." No. 9274.

Wilson, J. L.—"Distillation of tar and oils." No. 9220.

Guildford Housing Scheme Exhibition.—The firm of Messrs Curtis's and Harvey, Ltd., makers of "Ironclad" gas-mantles, had an attractive stand at the recent Guildford housing scheme exhibition. Knitting and burning machines were working so as to give visitors the opportunity of witnessing the most interesting processes involved. A show-case at the back of the stand contained complete ranges of finished mantles of upright and inverted type, including those for high-pressure, oil, and vapour lamps.

Gas for the Caterham Asylum.—The Institution Committee of the Metropolitan Asylums Board last week reported that in July the Board approved of the policy of obtaining gas for the Caterham Institution from an outside source in lieu of manufacturing it in the Asylum gas-works, and an agreement was entered into with the Croydon Gas Company to supply gas as required at the rate of 4s. 9d. per 1000 c.ft., less 10 p.ct. discount. When submitting their report the Committee were under the impression that the figure quoted was a firm one, but are now informed that the Company intended that the current price was to be charged—4s. 9d. per 1000 c.ft. being the figure at the time of their letter. They therefore recommended that an agreement be entered into with the Company to supply gas as required to the Caterham Mental Hospital at the current rate, less discount, according to consumption, on the Company's fixed scale.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF COMMONS.

Progress of Bills.

The South Metropolitan Gas Bill: Read a second time, and committed. Referred to the Committee on Unopposed Bills.

The St. Helens Corporation Bill: Reported with amendments, from the Local Legislation Committee.

The Standing Orders not previously inquired into having been complied with in the case of the Waltham and Cheshunt Gas Bill, it was ordered to be read a second time.

A petition has been deposited by the Lea Conservancy Board against the Waltham and Cheshunt Gas Bill.

Public Utilities Companies (Capital Issues) Act, 1920.

A copy of a report was presented on an application to the Board of Trade under the Public Utilities Companies (Capital Issues) Act by the Reading Gas Company.

German Gas Mantles, Burners, and Fittings.

Lieut.-Colonel Sir J. Norton-Griffiths asked the President of the Board of Trade the number of gas-mantles imported from Germany into this country since the commencement of the year; and whether he was aware that the whole of the British gas-mantle industry was threatened with ruin owing to the importation of German gas-mantles, which were sold in this country below the retail price in Germany.

Sir P. Lloyd-Greame, the Secretary of the Department of Overseas Trade, who replied, said the number of gas-mantles imported into the United Kingdom, consigned from Germany, registered during the period Jan. 1 to March 31 last, was 12,668 gross. Consideration had been given to the general position of the gas-mantle industry, and he was fully aware of its difficulties.

Sir J. Norton-Griffiths asked what had become of the report made at the time by the Committee who dealt with the Merchandise Marks Act, and before which important evidence was given with respect to this industry.

Sir P. Lloyd-Greame replied that the Government undertook to introduce a Bill as soon as possible to give effect to the recommendations of the Committee.

Sir J. Norton-Griffiths asked if this industry would be included in it.

Sir P. Lloyd Greame said the recommendations of the Committee were perfectly general in their character.

Sir J. Norton-Griffiths asked the number of gas-lamps and burner fittings imported from Germany into this country since the commencement of the year; and if he was aware that the importation of these German-made goods, which were sold at a lower price here than retailed in Germany, threatened men engaged in this trade with unemployment.

Sir P. Lloyd-Greame replied that the gas-lamps and burner fittings were not separately distinguished in the trade returns. The number of lamps and lanterns (except electric) registered as imported into this country during the period Jan. 1 to March 31 last, consigned from Germany, was 43,739. He had no information as to the relative levels of German domestic and export prices for the commodities mentioned.

COLNE CORPORATION BILL.

Part V. of this Bill—which came before the Local Legislation Committee of the House of Commons on Tuesday, April 5—dealt with the supply of gas by the Corporation. As originally presented, it provided for the granting of the powers which are to be sought by all gas undertakings under the Gas Regulation Act, 1920, by means of an Order from the Board of Trade, and fixed the maximum price of gas at 1s. 8d. per therm, with additional charges for the hire of prepayment meters, fittings, stoves, &c. The Board of Trade, however, reported to the Committee on the matter; and, before the Bill reached the latter body, Part V. was withdrawn, and it is understood that application is to be made to the Board of Trade for an Order in the ordinary course.

Gas for the Buckie Housing Scheme.—At the recent meeting of the Buckie Town Council a letter was received from the Buckie Gaslight Company, Ltd., regretting that, owing to the capital outlay required, they could not see their way to comply with the Council's request to lay gas-mains for the housing scheme. The Town Clerk was asked to report on the question whether the Council could compel the Company to lay mains up to the housing site.

Coke Ticket Fraud at Birmingham.—Yesterday week at the Birmingham Police Court, a gate keeper named Sedgwick, in the employ of the Birmingham Corporation Gas Department at the Windsor Street works, was charged with obtaining 2s. 5d. by false pretences. It was stated that Sedgwick had no authority to issue coke tickets or receive money for the Corporation. On the previous Friday morning a boy went to the works for a hundredweight of coke, and on the way to the pay clerk Sedgwick called him back saying: "Sonny, I've got a ticket for you," giving him one for a hundredweight of coke. The lad handed Sedgwick 3s., receiving 7d. change. Mr. W. Day, for the prosecution, said Sedgwick had been in the employ of the Corporation for twenty-eight years, and was receiving a wage of £5 8s. a week. These frauds had been going on for some considerable time. Thousands of pounds' worth of materials came under Sedgwick's control; and drastic steps should be taken to show, not only him, but others, that the Magistrates would not tolerate this kind of thing. Accused pleaded guilty. The Magistrates, in sending him to gaol for two months, took into consideration the loss of his situation and any emoluments he might have received at the end of his service.

LEGAL INTELLIGENCE.

LIABILITY OF LIGHTING AUTHORITIES.

Sheppard v. Mayor and Corporation of Glossop.

On Thursday last, an appeal by defendants in the action of *Sheppard v. Corporation of Glossop*, which was tried before Mr. Justice Greer at Manchester, was heard before Lords Justices Bankes, Scrutton, and Atkins. The action was brought to recover damages for personal injuries, and resulted in a judgment for the plaintiff for £279 10s. The appeal raised a question of some importance to all local authorities outside the Metropolitan district. The facts of the case are sufficiently stated in the judgment.

Mr. Barrington Ward, K.C., appeared for appellants; while Mr. Eastham represented the respondent.

Lord Justice Bankes said the appeal raised an important question to local authorities, as plaintiff alleged that defendant corporation were liable to him in damages for personal injuries which he sustained owing to the failure of defendants to keep a lamp alight at a dangerous spot within their area. Mr. Justice Greer had decided in plaintiff's favour, considering himself bound by a decision of the Court of Appeal in *Lamley v. East Retford Corporation*; and therefore it became necessary to consider whether that case was rightly decided. There was no dispute about the facts of the present case. Within the district of the Glossop Corporation there was a highway called Dun Lane. At this particular spot the ground was on a considerable incline; and at some time a cutting was made to form the lane, and a retaining wall was built in order to keep-up the ground. On Christmas night the plaintiff was visiting a friend in the immediate neighbourhood of the lane. Late at night he left the house, and instead of striking the entrance of the lane he got on the higher ground and fell over the retaining wall, sustaining serious injury. There was close to where he fell a gas-lamp, which had been erected by the Corporation under their statutory power, and was lighted by their servants. On the date in question, the lamp was extinguished about 9 p.m. by order of the Corporation, so as to economize. The learned Judge had found that had the lamp been alight the accident would not have happened; and great stress had been laid on this finding on behalf of respondent. Now the first thing to consider was, what was the statutory position of the Corporation with regard to this particular lamp? It was agreed that the statutory authority for the lighting of the district was to be found in section 151 of the Public Health Act, 1875; and the true effect of the section was that it gave the Corporation authority to light the district, but it created no obligation to light it, and it gave a discretion as to the time during which the lamp should be kept alight. There was a great distinction to be drawn between the power given to a local authority under this section and the power given under section 131 of the Metropolis Management Act, which created a distinct obligation to light. A material point to consider was how far the decision of Lord Esher in *Lamley v. East Retford Corporation* applied. The liability of defendants did not depend on whether they lighted a part of the district sufficiently or not; and if Lord Esher intended to lay down, as a matter of law, that under the Public Health Act the local authority were under an obligation to light the whole town reasonably and sufficiently, all his Lordship could say was that he was not able to agree with the view thus expressed. He thought the case had not been correctly reported, and was of opinion that there was no authority to support the proposition that section 161 of the Public Health Act created any obligation on the local authority to light any part of their district. In many cases it had been held that the plaintiff had failed to establish any duty on the part of the defendants towards him arising out of the mere fact to light a particular part of the district. The cases in which a person had succeeded in establishing a liability arising from the failure to light were all cases in which the plaintiff established that he had a cause of action against the defendants arising out of their having caused to be placed in the public highway something which was an obstruction and dangerous unless sufficiently lighted. This was the case in *Morrison v. Sheffield Corporation*. Now what had the Legislature authorized in this particular case? It was the supplying of gas for lighting this particular district; and if in doing this they acted negligently, they would be liable. If they erected a lamp-post so near a highway as to be a source of danger to passers-by, unless properly protected, or if they laid the gas-mains in such a way that gas escaped into adjoining houses, they would be liable. But this rule was not applicable to the exercise of discretion by the local authority as to how long they should allow the lamps to be kept alight, or whether they should cut-off the supply of gas to some lamps in the district and continue it to others. It seemed to his Lordship impossible to contend that the local authority were under an obligation to place a lamp at this particular spot, as they could be under no liability for taking it away; and, that being so, they could be under no liability for either cutting-off the supply of gas to the lamp, or turning off the light at any particular hour. He thought the plaintiff had failed to establish that the defendants were under any duty to him to keep the lamp alight; and, that being so, he thought the learned Judge had arrived at a wrong conclusion.

Lord Justice Scrutton, in concurring, said under the Public Health Act the local authority were under no obligation to light, or to continue the lighting. It was a matter of discretion. But if they did light, they would be liable in damages for negligence in lighting or for placing an obstruction in the street and not lighting it. But they were not liable for not exercising their discretion to light.

Lord Justice Atkin concurred.

The appeal was allowed, and judgment entered for defendants.

Dublin's Lighting Bill.—In connection with the new municipal rates in Dublin, it is reported that the original estimate of £80,000 for public lighting was reduced to £60,000 by the Estates and Finance Committee in consultation with the Lighting Committee.

MISCELLANEOUS NEWS.

MR. SAMUEL GLOVER'S RETIREMENT.

A Long and Honourable Record.

In these words does the St. Helens newspaper preface the report of the meeting last week when the St. Helens Town Council voiced their appreciation of the services of the retiring Engineer and General Manager of the gas-works, Mr. Samuel Glover, M.Inst.C.E.

Alderman Crooks, in moving the confirmation of the minutes of the Gas and Lighting Committee [see p. 79] said it was hardly necessary for him to add anything in support of the resolution of the Committee expressing appreciation of Mr. Glover's services. They all knew the faithful, efficient, and satisfactory manner in which Mr. Glover had carried out his duties. It rarely fell to the lot of an official to serve the town for so long a period as fifty years, as Mr. Glover had done; and he had every reason to feel proud of his long and honourable record of service, and the high position he had attained in the gas industry by his zeal and ability. Mr. Glover had always kept himself well in advance of the times; and he was recognized to-day as one of the leading authorities on gas production. Mr. Glover would have the satisfaction in his retirement of knowing that his name would always remain associated with vertical retorts, which had proved so successful, and had more than justified their adoption. He was quite sure he would carry with him in his retirement the good wishes of every member of the Council.

Alderman J. Phythian associated himself with Alderman Crooks' remarks, with which, he said, he was in entire agreement.

Councillor Waring in doing likewise, said he had been on the Council some length of time, and it had fallen to his lot to lighten some of the dark places on the earth. Things had become somewhat neglected; and there had been great scope for his services in regard to lighting. But he had always found Mr. Glover ready and anxious to go to any amount of trouble as regards places where he (Mr. Waring) had suggested that improvements might be made.

The minutes of the Committee were then approved.

SOUTHEND GAS STRIKE.

Terms of Settlement.

A settlement has happily been arrived at in the dispute between the Board of the Southend Gas Company and their men, which resulted in the latter going out on strike, and putting the residents and visitors to the town to the extreme of inconvenience. We need not go over the points preceding the arrival at an agreement. But it may be mentioned that negotiations and conferences went on almost continuously during the past week between representatives of the Board and men; but it was not until Friday afternoon that the following terms were agreed to for submission to the whole Board and general body of the men:

(1).—Work to be resumed at ten o'clock this (Friday) night. The men to be employed on the same conditions as before.

(2).—Current rates of pay will be continued till Sept. 30 next.

(3).—Shift men will be engaged so as to be subject on either side to one week's notice.

(4).—The Board will prepare a scheme for wages to rise or fall according to index figures of cost of living, but not to fall below a minimum which shall secure a status substantially above pre-war rates. To be submitted to the men's Union. If agreement thereon is not reached, the scheme shall be submitted to arbitration.

(5).—If, after aforesaid scheme has been settled, by its working it shall show in favour of the men, that result shall operate in substitution of No. 2.

(6).—The Company to pay to each man 40s., and to each boy 20s., as a bonus; one-half on Friday, the 15th inst., the other half on July 8th next.

The Board soon afterwards accepted the terms, and so did the men—work being resumed at 10 o'clock on Friday night. So Southend was again with gas during the busy week-end, much to the satisfaction of residents and visitors.

LIVERPOOL LIGHTING ENGINEER'S REPORT.

In his report for 1920, Mr. A. G. Smith, the Liverpool City Lighting Engineer, states that during the year an attempt was made to place the lighting on its pre-war footing. As far as the lamps in streets and courts were concerned, this was accomplished; but the re-fitting of passages was not completed. Irrespective of courts and passages, the total length of roads equipped for lighting amounted, at the end of the year, to 503¾ miles—8⅝ miles being by electricity; 490⅛ miles by incandescent gas; ½ mile by flat-flame burners; and 4½ miles by oil-lamps (Woolton).

The maintenance of the columns, brackets, lamps, and fittings had been hitherto entirely carried out by the Department from the Hood Street premises; but during the year, owing to the transfer of the work of trimming and maintaining the incandescent gas-burners in the lamps from the lamp-lighting to the workshop staff, it was necessary to decentralize the work. A new depôt was therefore opened at Old Swan, and those in the other outer areas were re-organized; thus enabling the extra work to be carried out with the minimum of delay in travelling.

During the year the material sold to contractors brought in a revenue of £442 11s. 2d.

The number of meters tested in the year was the highest on record—19,851. The fees for this amounted to £601 1s. Tests of the gas at the various stations involved 112 visits; and on 110 occasions traces of sulphuretted hydrogen were revealed in the gas. It is estimated that the average quantity of carburetted water gas in the supply was as high as 44·2 p.ct. The pressure at the various stations was maintained above the standard of 12-10ths. The following table shows the results of tests for calorific and illuminating power:

Station.	B.Th.U. per Cubic Feet of Gas. Gross.			Illuminating Power Candles. Flat Flame.
	Average.	Maximum.	Minimum.	
Wavertree . .	488·60	616·57	424·61	4·35
Caryl Street .	481·58	545·52	418·86	3·86
Eccles Street .	476·28	526·20	430·09	3·50
Athol Street .	467·63	559·51	429·20	3·27
Linacre . .	470·64	519·83	429·53	2·82
Garston . .	488·30	529·59	439·50	3·53
Average . .	478·84	—	—	3·55

One of the activities of the Department is the major portion of the gas-fitting work in Corporation establishments, involving the laying and maintenance of the gas supply to new buildings, such as artizan's dwellings; also the maintenance of the gas-fittings in the majority of the numerous establishments under the control of the various Committees, including over 6000 incandescent gas-burners in schools and hospitals.

The total charges in connection with the public lighting of the city, and the supervision of the gas supply, for the year amounted to £98,715 19s. 4d. A revenue of £5895 18s. 6d. was derived from work charged to other departments and bodies, making the net expenditure £98,820 0s. 10d.

GAS REGULATION ACT APPLICATIONS.

The following further notices have appeared in the "London Gazette" of applications by gas undertakings to the Board of Trade for Orders under the Gas Regulation Act.

Burnham Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 3s. 9d. per 1000 c.ft.; and the price which they have asked the Board of Trade to substitute for this is 1s. 8d. per therm.

Chertsey Gas Consumers' Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 4s. per 1000 c.ft.; and the price which they have asked the Board of Trade to substitute is 1s. 5·8d. per therm.

Kidsgrove Gaslight Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 3s. 3d. per 1000 c.ft. within the parishes of Kidsgrove and Hardingswood, and 3s. 6d. per 1000 c.ft. within the remainder of the limits of supply; and the price which they have asked the Board of Trade to substitute for this is 19·85d. per therm within the parishes of Kidsgrove and Hardingswood, and 20·5d. per therm within the remainder of the limits of supply.

It is also proposed that additional charges per therm should be authorized in respect of gas supplied through a prepayment meter

Shanklin Gas Company.

The standard prices now authorized in respect of the supply of gas by the undertakers are 4s. 6d. and 5s. per 1000 c.ft.; and the prices which they have asked the Board of Trade to substitute for these are 1s. 9d. and 1s. 10d. per therm.

Shrewsbury Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 3s. 4d. per 1000 c.ft., with a neutral zone down to 2s. 11d.; and the price which they have asked the Board of Trade to substitute for this price is 1s. 8·6d. per therm, with a neutral zone down to 1s. 7·6d.

Taunton Gas Light and Coke Company.

The standard prices now authorized in respect of the supply of gas by the undertakers are 3s. 9d. and 4s. 3d. per 1000 c.ft.; and the prices which they have asked the Board of Trade to substitute for these prices are 1s. 10d. and 1s. 11$\frac{3}{10}$d. per therm respectively.

The higher standard price relates to such other parts of the Company's limits of supply as are not comprised within a square, the opposite sides of which run respectively north and south and east and west, and are each one mile distant measured in a direct line due north, south, east, and west from the Market House, Taunton.

Ventnor Gas and Water Company.

The maximum price now authorized in respect of the supply of gas by the undertakers is 5s. 10d. per 1000 c.ft.; and the price which they have asked the Board of Trade to substitute for this price is 2s. 3d. per therm.

DECLARATION OF CALORIFIC POWER.

The following further companies have intimated the calorific power of the gas they intend to supply:

Eastbourne Gas Company.—475 B.Th.U. (May 1).
Pinner Gas Company.—500 B.Th.U. (May 9).

The annual staff dinner of the Sheffield Gas Company, held last Friday week, was largely attended. Mr. Ralph Halkett, the General Manager, presided, and a very enjoyable evening was spent. A programme of miscellaneous items was carried out by members of the staff—a feature being the glees rendered by the Male Voice Choir.

CURRENT SALES OF GAS PRODUCTS.

Readers will have noticed that, for some weeks past, there has not appeared in this column any price for crude tar and tar products; and numerous inquiries have reached us as to the reason of the omission, and the likelihood of the figures being supplied in future. The reason for the omission may be thus explained:

1. Until towards the end of February, any prices given for pitch could only have been approximate, and represent the price that tar distillers were trying to obtain, rather than what could be secured by sellers.
2. The price quoted for creosote oil could only be realized for very small retail quantities. Negotiations were at the time pending with America, in three different quarters; and it was not known what figure would be eventually obtained.
3. Tar consists of (say) 5 p.ct. of water, 5 p.ct. of rectified products, 60 p.ct. of pitch, and 30 p.ct. of creosote, so that until actual prices could be fixed for pitch and creosote, it was impossible to state a fair price for tar.

From the beginning of January, pitch was artificially maintained in value, in the hope that a large order would be obtained from the Continent. This order, however, was never given, owing to slackness of trade and large accumulations of fuel in France and Belgium.

Creosote was in much the same position; and finally, instead of 1s. 2d. per gallon f.o.b., the figures realized were 10d., 9⅞d., and 9¼d. per gallon.

It is, however, possible now to decide what may be considered as the approximate values of pitch and oil, as from the beginning of February; also what may be regarded as the equivalent price of tar.

The figures are as follows:

	Tar.		Pitch.	Creosote.
	s. d.	s. d.	s. d.	s. d.
Feb. 21.	90 0	100 0	90 0	1 0
,, 28.	85 0	95 0	85 0	0 11½
March 7.	76 0	86 0	80 0	0 10
,, 14.	73 0	83 0	75 0	0 9¾
,, 21.	69 0	79 0	70 0	0 9¼
,, 28.	67 6	77 6	67 6	0 9¼
,, 29.	66 0	76 0	65 0	0 9
April 4.	65 0	75	65 0	0 9

The London Market for Tar, Tar Products, and Sulphate.

London, *April* 11.

In the London tar products market, the recent conditions continue to prevail. Of course, the present unrest among certain workmen, in addition to unemployment in other directions, only serve to longer defer a tendency towards an improvement in trade. Owing to absence of new business, prices mainly are nominal.

Sulphate of ammonia continues to be taken by the farmers in fair quantity, considering the lateness of the fertilizer season.

Tar Products in the Provinces.

April 11.

The average values for gas-works products during the week were: Benzole 90 p.ct. North, 2s. 10d. to 3s.; crude 65 p.ct. at 120° C., 2s. 3d. to 2s. 5d. naked at makers' works; 50-90 p.ct. naked, North, 2s. 11d. to 3s. 1d. Toluol, naked, North, 3s. to 3s. 1½d. nominal. Coal tar crude naphtha in bulk, North, 11½d. to 1s. Solvent naphtha, naked, North, 2s. 3d. to 2s. 4d. Heavy naphtha, North, 2s 9d. to 3s. Creosote, in bulk, North, liquid, 8½d. to 8¾d.; salty, 8d. to 8½d. Heavy oils, in bulk, North, 10½d. to 11½d. Carbolic acid, 60 p.ct., 1s. 8d. to 1s. 10d. Naphthalene, £20 to £30; salts, £7 to £9, bags included. Anthracene, "A" quality, 10d. to 1s. per minimum 40 p.ct.; "B" quality, nominal.

FROM A MARKET CORRESPONDENT.

Tar Products.

The weakness prevailing in tar products continues, and very little change is to be noted in the market. Curiously enough there is no demand for anything, with the possible exception of tar. Yet, if the coal strike continues for any length of time, there will soon be no tar products available. A few months ago a discontinuance of production would have sent consumers into the market, and prices would have been rushed-up. The fact that these conditions do not prevail now is a sure sign of the depressed and almost demoralized condition of the market. It is still difficult to fix any selling price of pitch which is likely to be correct. There are reports that 60s. has been accepted, while from other centres come reports of 75s. being paid. In any case there is very little doing, and even those who have bought on contracts are discontinuing deliveries as far as possible, and doing their best to meet their loss. Solvent naphtha is still a weak market owing to the falling-off of the demand from the rubber manufacturing industry; and it is impossible to obtain accurate prices. With the end of the season and the approach of the warm weather, the demand for crude naphthalenes for the fire-lighter industry has fallen off, and prices are hardly worth talking about. Refined naphthalene, however, is fairly steady. Carbolic acid and cresylic acid are neglected, and quotations hardly mentioned. Benzole, of course, is still in demand; but the price is kept down by petrol. Intermediate

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products, on the other hand, are very firm, although there is very little change in quotations.

Sulphate of Ammonia.

Although orders are coming along slowly, there is nothing like the activity of a normal spring season. Probably the forward condition of growth assists the farmer in holding-off the market. In some quarters too the price is considered high; but as time goes on there may be some reduction, although this is quite out of the question during the remainder of the present season. Indeed, owing to the Coal Strike and the closing-down of coke-ovens, outputs are falling away rapidly; and if this does not bring about an advance in price, it will certainly produce a congestion of orders later on, which it will be impossible to execute in full. American advices do not show any change; the markets being more or less a waiting one.

NATIONAL BENZOLE AND MOTORISTS.

The National Benzole Company, Ltd., have of late received several letters from motorists asking how they should adjust the carburettor of their car when using "National" benzole or a mixture of "National" benzole and petrol. They have, therefore, issued some useful practical hints in order that the motoring public may obtain at least 20 p.ct more miles to the gallon by using "National" benzole than is possible with any other motor spirit. The Company send us for publication a copy of the practical hints referred to. They are as follows:

Practical Hints to Motorists.

Assuming your carburettor is correctly adjusted for petroleum spirit, the rate and flow for the use of "National" benzole should be reduced from 10 to 12 p.ct.

Method of Carrying-out Adjustment.—Run engine for a short time to make it warm. Set throttle so that engine runs about 600 to 800 revolutions per minute. If exhaust gases are black and sooty, the jet requires reducing. After making a reduction, see that valve-caps and plugs are quite clean. Make a trial run of 20 to 50 miles, then examine valve-caps and plugs for signs of sooting-up; if such are present, the jet needs further reduction. It will also be found that the engine runs cleaner by jet reductions than by increased air.

Engine Lubrication.—"N.B.C." oils are specially prepared to give maximum efficiency, and do not permit a chemical reaction when in contact with benzole vapours.

The Provisional Order promoted by the Glasgow Corporation is unopposed. Under it, power is sought to borrow a sum of £3,000,000, for the erection and reconstruction of buildings and plant at the city gas-works.

HALIFAX GAS COMMITTEE AND WHITLEY COUNCILS.

At a meeting of the Halifax Town Council, last Wednesday, the Gas Committee asked the Wages Committee to consider "whether it is in the best interests of the Corporation to continue as members of the various Whitley Councils"—the opinion of the Gas Committee being that it is inadvisable to withdraw from membership.

Councillor Court said it was strange that Halifax, of all places, where the name of Whitley was held in such regard, should be the only local authority trying to get out of the Whitley Councils.

The Mayor disputed this statement; but Mr. Court said he had a letter to the effect that what he said was correct.

Coupled with the discussion was a question raised by the Wages Committee in regard to 1d. per hour advance to workers in non-trading departments, provided the pay was reduced according to the cost of living. The debate got somewhat lively; the two resolutions being inextricably mixed together.

The Mayor held that a thing should not be accepted merely because a Whitley Council decided that way. The award, which one Councillor held ought to have been paid four months ago, was declared by the Mayor to have been put in operation only by two out of about 170 authorities concerned.

Alderman H. Clay, the Chairman of the Wages Committee, said he had always been a supporter of Whitley Councils; but it was possible that an unwise resolution might pass through such a Council, and the one under discussion was unwise. He urged that something should be provided in Whitley Council agreements so that wages should come down with the cost of living. Unless this was done, he would certainly be found amongst those who were against Whitley Councils.

Eventually an amendment to the recommendations was defeated; but the matters were referred back.

Gas-Works Engine Fatality.—A sequel to the recent fatal accident in connection with the Aberdeen Gas-Works train is noted in their report to Aberdeen Town Council by the Gas Committee. It is pointed out that in the verdict of the Fatal Accident Inquiry regarding the death of a fish hawker, who was run over by the locomotive of a gas-works train, the jury added a rider stating that "the speed at which the locomotive was proceeding at the time of the accident was round about five miles an hour. They consider that no criminal blame attaches to the driver or guard. They recommend for the future that the speed of the train should be such that a man can walk in front, preferably about five yards in advance, on the left-hand side." The receipt was reported by the Committee of a claim for damages against the Corporation on behalf of deceased's widow and family. Without admitting liability, the Committee had made an offer of an *ex gratia* payment in full settlement of the claim; but this offer had not been accepted.

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Waste Heat and Gas.

On March 31, the annual meeting of Waste Heat and Gas Electrical Generating Stations, Ltd., was held in Newcastle, when Mr. E. Lloyd Pease (the Chairman), in moving the adoption of the Directors' report, remarked that the capital expenditure during the year was £25,739. Of this amount £23 973 had been in connection with the new power station at Horden—the balance representing expenditure on sundry works at their other power stations. The Horden station had been completed; but the period of construction had been excessively long and expensive. The profits for the year amounted to £34,439, which was £5187 less than the previous year. This was due to the large interest charge on the capital expenditure at both Horden and Weardale, which was as yet unproductive, and to the higher costs at Weardale. In the aggregate, the output from the Company's stations has been maintained; so that the whole diminution in the profits for the year was accounted for by these two reasons. The return on the Company's investments had been satisfactory, and was £1200 more than the previous year. Provision of £1000 had been made in the accounts for Corporation Profits Tax; and the Directors set aside £14,000 to the reserve and recommended a dividend of 8 p.ct. for the year, leaving a balance of £12,603 to be carried forward. The report was adopted; a dividend was declared in accordance with the recommendation of the Directors; and Mr. Pease was re-elected to his seat at the Board.

Shortage of Gas at Peterborough.—Last week-end the Directors of the Peterborough Gas Company intimated that they had had no delivery of coal since March 30, and unless further supplies were allowed, their present stocks would be exhausted on Wednesday (to-day), when the city would be without gas.

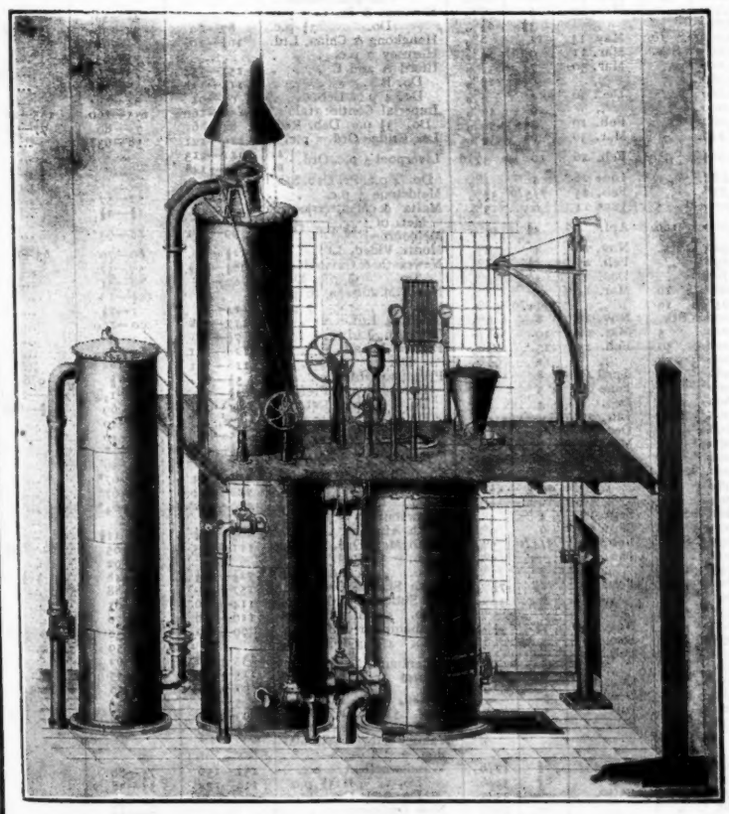
Housing Scheme at Barrow.—At the Barrow-in-Furness Town Council meeting on April 4, the Gas Committee, in regard to the housing schemes in the borough and the laying of service-pipes, recommended to the Housing Sub-Committee that, with a view to arriving at an amicable settlement of points in dispute, the Gas and Water Committee agree to bear half the cost of the work of laying the gas services from the boundary to the meters of the houses from the time such work was taken over from the Gas Department by the United Operative Plumbers' Association, on the understanding that the Housing Sub-Committee will bear the other half of such cost. Also that the local branch of the Association be informed that, owing to the difficulty the Committee are experiencing with the Housing Commissioner regarding payment for the laying of the service-pipes, it is the Committee's intention, on the completion of the services which the Association's members are laying, to lay the services to the remainder of the houses on the site from the main to the meter; and further that, in future, it is their intention to lay all gas services from the main to the meter.

The "Sittingbourne" Carbonization System for Kendal.—The Gas Manager reported at the last meeting of the Kendal Corporation that he had made an inspection of the "Sittingbourne" system of total carbonization; and it was agreed that a single unit of the plant be purchased at a cost of £325, provided an option be obtained to instal a second unit within a period of six months, at a total cost of £595.

Presentation to a Gas-Works Official.—Mr. Hector Turnbull, M.M., Assistant Manager of the Scunthorpe Gas-Works, was the recipient of several handsome presents during the week-end preceding his departure to take up his new appointment as Manager of the Cleator Moor Gas-Works. The Council officials gave him a Jacobean fumed oak occasional table; the workmen at the gas-works a handsome gold albert; and the members of the Scunthorpe Amateur Operatic Society a silver cigarette case.

Yeadon and the "Therm" Basis Order.—At a meeting of the Rawdon District Council last week, the Manager of the Yeadon and Guiseley Gas Company (Mr. J. Lister Cooper) explained the nature of the Company's application to the Board of Trade under the Gas Regulation Act. He said the Company proposed to erect new plant at a cost of about £5000; and a better supply of gas would be guaranteed. Gas would be produced for heating rather than lighting qualities; and users of incandescent burners would reap the benefit. Mr. Cooper said that in the first batch of applications published by the Board there was not one asking for so modest a charge per therm as Yeadon. The Clerk stated that a joint conference of District Councils in the Company's supply area was being convened. Several speakers remarked that there was a certain amount of public suspicion that the change was a roundabout way of increasing the price. The matter was eventually deferred until after the joint conference referred to.

Stockton Corporation Price of Gas.—The price of gas for the quarter ending June 30 has been advanced to 4s. per 1000 c.ft. at Stockton and Thornaby, 4s. 10d. at Eaglescliffe, 5s. 1d. at Billingham, and 5s. 6d. at Wolviston. The Corporation have also decided to advance the scale of charges for power purposes; and no discount is to be allowed. For the first 50,000 c.ft. of gas supplied in Stockton and Thornaby the price will be 3s. 5d. per 1000 c.ft., falling to 3s. 2d. on consumption exceeding 250,000 c.ft. At Eaglescliffe, Billingham, and Wolviston the corresponding prices will be 3s. 11d. and 3s. 8d. The present price of gas to ordinary meter consumers is 3s. per 1000. At the annual finance meeting of the Corporation held on March 31, Alderman Nattrass stated that the average charge for gas in the town in 1911 was 2s. 4½d. per 1000 c.ft.; it was now 2s. 6d. With respect to the gas-works undertaking, a sum of £2421 was available for transfer to the reserve. From this fund the Gas Committee contemplated certain items of capital expenditure—including the renewal of the low-level telpher, £2400; alterations to the tar plant, £1803; and alterations to the retort-house, £1338. Sanctions for the borrowing of fairly substantial sums for works' extensions were now awaiting the approval of the Ministry of Health.



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City Corporation and the Gas Light and Coke Company's New Standard Price.—At a meeting of the Court of Common Council of the Corporation of the City of London on Thursday last, a letter was received from the Director of Gas Administration of the Board of Trade, enclosing a copy of the Gas Light and Coke Company's new Order, the full text of which was given in the "Journal" for March 30 last, p. 799. The matter was referred to the Streets Committee.

Price of Gas in Edinburgh.—It is probable (a correspondent writes) there will be an increase in the price for gas. Bailie F. J. Robertson states that the first thing that requires to be done to cheapen Edinburgh gas is to instal vertical retorts. An important report on this change was considered by the Commissioners last year. It is also necessary to increase the consumption of gas to cheapen the price. He added that the Sales Department required to be developed, and advocated a local publicity campaign. A very large number of the consumers did not use it for cooking and heating.

Gas-Works Foreman Honoured.—Last Thursday some sixty men of the various departments at the Elswick Gas-Works of the Newcastle and Gateshead Company met to do honour to Mr. Harry Millington, on his completing 55 years' service with the Company last January. Some 35 years of this period were spent as foreman blacksmith; and Mr. Millington is continuing with the Company. Mr. E. P. Tarratt, the Chief Engineer, occupied the chair. On behalf of the men of the works Mr. G. L. Swallow, the Works Manager, presented Mr. Millington with a wallet of Treasury notes, and stated that the present and several past Chief Engineers and other officials had contributed to the gift. He (Mr. Swallow) had known Mr. Millington for about half-a-century. It was a pleasure to state that Mr. Millington had introduced appliances for easing the labour of the workpeople and the Company had also benefited. He trusted he would be long spared to enjoy the gift with his wife and family. Mr. Millington suitably acknowledged the gift.

STOCK MARKET REPORT.

The Stock Exchange got through last week remarkably well, all things considered. No one would have been surprised if, in such a critical and alarming time, markets almost went to pieces. But far from that, the leading departments set a fine example of steadiness.

The gilt-edged market was remarkably firm. Home Government issues held on with scarcely any variation at the close. Friday's figures for the big four were: Consols 47¼-48¼, War Loan 86⅞-87⅛, Funding 70-70⅜, Victory 76½-76⅝. Bonds recovered from an earlier weakness. Corporation issues did not suffer. The firmness of Home Rails, in the face of N.U.R. threats, was conspicuous and highly encouraging. Canadians had a trying time, and Argentines were dull.

The Foreign Market showed strength; Brazilian, Chilian, and Japanese being to the front.

The Miscellaneous Market was not remarkable for strong points. Business in the Gas Market was fairly well maintained in point of volume; but the general tendency was all in the direction of lower prices. In the London Companies, Gas Light ordinary fell 1½, and both Commercial issues 2. In Suburban and Provincial, Hastings and St. Leonard's, 5 p.ct. fell 5, and the 3½ p.ct. fell 1½; but Croydon "B" and "C" rose 5. Newcastle was 2 lower. In the Continentals, Imperial was put down 6; but European was firm. Primitivas were quiet and unchanged.

Bargains done for cash during the week were as follows: On Monday, Croydon "C" 104½, 105, European 6⅞, 7, 7⅛, Gaslight ordinary 52, 53½, 54½, 54⅝, ditto debenture 47, Imperial Continental 160, 161, ditto debenture 78, Monte Video 63, South Metropolitan 63, 63¼, Tottenham "B" 52, Plymouth and Stonehouse 58½. On Tuesday, Bournemouth "B" 8⅜, 8⅞, Commercial 4 p.ct. 47, Gas Light ordinary 51, ditto maximum 41, 42, ditto preference 57½, 58, Imperial Continental 158, 161½, Monte Video 65, Tottenham preference 62, 62½, Plymouth and Stonehouse 58½. On Wednesday, Commercial 4 p.ct. 47, European 7¼, Gas Light ordinary 51, 51½, 52½, ditto maximum 41, 42, ditto debenture 48½, Hastings and St. Leonards 3½ p.ct., 37½, 38, Imperial Continental 156, ditto debenture 78, South Metropolitan 62½. On Thursday, Commercial 4 p.ct. 48, ditto debenture 49, Gas Light ordinary 51, 51½, 52, 52¼, ditto debenture 47½, 48, Hastings and St. Leonard's 5 p.ct. 49, ditto 3½ p.ct. 34, Imperial Continental 157, 157¼, 157½, ditto debenture 77, Primitiva 9s. 6d., ditto preference 25s., 26s., ditto debenture 67⅜, 68¼, South Metropolitan 62, 62½, 62⅝, 63, ditto debenture 46⅛, Tottenham "B" 52, Brighton and Hove 5 p.ct. debenture 65, 65⅛, Holyhead and North Wales 4s. 2½d. On Friday, European 7, 7¼, Gas Light ordinary 51½, 51⅝, 52, 52⅜, 52½, ditto maximum 40½, 41¼, 42, ditto preference 57½, 58, ditto debenture 46½, Imperial Continental 155, 155½, 156, 156½, 157, 157¼, ditto debenture 77, 78, Monte Video 64½, 65, Primitiva preference 26s. 3d., 27s. 1½d., ditto debenture 68¼, South Metropolitan 63, 63¼, Southampton 56, 56½.

In the Money Market, there was at all times a good demand, especially later in the week; but there was no degree of pressure—the supply being always equal to the demand. Discount rates were mostly steady. Silver made some recovery. The Bank rate remains at 7 p.ct., as fixed on April 17, 1920.

The Castlebar Gas Company, Ltd., is in liquidation; and the works are being offered for sale as a going concern.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Ante-War Dividend & Bonus.	Last Dividend.	NAME.	Closing Prices, July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
£			p.c.					
182,049	Stk.	Mar. 11	4	4%	Aldershot 4 p.c. Pref.	...	53—58	...
1,551,868	,,	Oct. 14	2½	3⅛%	Alliance & Dublin Ord.	59—64	38—43	...
374,000	,,	Jan. 13	4	4%	Do. 4 p.c. Deb.	76—79	47—52	...
280,000	5	Oct. 28	7½	8%	Bombay, Ltd.	5½—6½	4—4½	...
100,000	5	Feb. 25	16	5%	Bournemouth Gas and Water — 5 p.c.	...	7—8	...
583,110	10	,,	7	7%	Bournemouth Gas and Water — B 7 p.c.	15—15½	8½—9½	8½—8⅞
115,000	10	,,	6	6/-	Bournemouth Gas and Water — Pref. 6 p.c.	13½—14	7½—8½	...
162,065	—	Dec. 30	—	4%	Bournemouth Gas and Water — 4 p.c. Deb.	...	55—60	...
992,045	Stk.	Feb. 25	14	30/-	Brentford A Consolid.	261—266	50—55	...
734,920	,,	,,	11	26/3	Do. B New	204—209	47—52	...
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	68—73	...
221,400	,,	Dec. 15	4	4%	Do. 4 p.c. Deb.	91—93	57—59	...
214,775	,,	Mar. 11	11	7½%	Brighton & Hove Orig.	208—213	95—105	...
244,200	,,	,,	8	5½%	Do. A Ord. Stk.	154—159	65—75	...
1,287,500	Stk.	July 29	5	5%	Bristol 5 p.c. max.	...	...	...
530,000	20	Mar. 30	12½	10%	British	44—45	21—23*	...
120,000	Stk.	Dec. 30	4	4%	Do. 4 p.c. Deb. Stk.	88—90	50—55	...
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	37—40	...
100,000	10	May 27	—	—	Cape Town & Dis., Ltd.	1½—2½	7—7½	...
100,000	10	Dec. 10	—	4½%	Do. 4½ p.c. Pref.	4—6	5—6	...
100,000	Stk.	Dec. 30	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	55—60	...
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	...	...
1,513,280	,,	Feb. 25	5/9/4	30/-	Commercial 4 p.c. Stk.	106—108	47—52	47—48
560,000	,,	,,	5½	26/3	Do. 3½ p.c. do.	103—105	45—50	...
475,000	,,	Dec. 15	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	42—45	49
800,000	,,	Dec. 11	4	—	Continental Union Ltd.	76—79	20—25	...
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	30—40	...
51,600	,,	Feb. 5	15	10%	Croydon A 10 p.c.	...	120—130	...
278,400	,,	,,	12	7%	Croydon B and C 7 p.c.	...	95—105	104½—105
55,000	,,	—	4	4%	Derby Con. Stk.	123—125	...	...
1,002,180	10	Jan. 29	10	5/0	Do. Deb. Stk.	102—104	...	...
16,298,975	Stk.	Feb. 10	4/17/4	30/-	European, Ltd.	17⅛—18	6½—7½	6½—7½
2,600,000	,,	,,	3½	26/3	Gas Light and Coke — 4 p.c. Ord.	98—102	51—54	51—54⅜
4,062,235	,,	,,	4	4%	Gas Light and Coke — 3½ p.c. max.	76—79	40—43	40½—42
4,674,850	,,	Dec. 15	3	3%	Gas Light and Coke — 4 p.c. Con. Pref.	96—99	56—59	57½—58
130,000	,,	Dec. 11	10	10%	Gas Light and Coke — 3 p.c. Con. Deb.	72¼—74½	46—49	46½—48½
82,500	,,	Mar. 11	5	3⅛%	Gas Light and Coke — 10 p.c. Bonds.	...	...	...
258,740	,,	,,	3½	2½%	Hastings & St. L. 5 p.c.	...	48—53	49
70,000	10	May 13	11	8%	Do. 3½ p.c.	87—89	34—39	34—38
86,600	Stk.	Mar. 11	9	5⅝%	Hongkong & China, Ltd.	16½—16¾	8¼—9¼	...
131,000	,,	Mar. 30	7½	3⅛%	Hornsey 7 p.c.	...	75—85	...
65,780	,,	,,	6½	2½%	Ilford A and C	151—154	75—79*	...
65,500	,,	Dec. 30	4	4%	Do. B	115—118	55—60*	...
4,940,000	,,	,,	9	4½%	Do. 4 p.c. Deb.	92—94	54—56·	...
1,235,000	,,	Feb. 10	3½	3½%	Imperial Continental	150—160	155—160	155—161½
235,242	,,	Mar. 30	6½	3⅛%	Do. 3½ p.c. Deb. Red.	84—86	75—80	77—78
2,498,905	,,	Feb. 26	10	37/6	Lea Bridge Ord. 5 p.c.	119—121	58—63*	...
306,083	,,	June 26	4	4%	Liverpool 5 p.c. Ord. — A.	211—213	...	...
165,736	,,	Feb. 25	7/5/6	3⅛%	Liverpool 5 p.c. Ord. — B.	146—148	...	...
75,000	5	June 11	6	3%	Do. 4 p.c. Pr. Deb. Stk.	...	...	...
250,000	100	Apl. 1	4½	4½%	Maidstone 5 p.c.	...	52—57	...
541,920	Stk.	Nov. 26	4	6%	Malta & Mediterranean	4½—4⅝	1⅝—2½	...
1,875,892	,,	Feb. 25	4½	3⅛%	Met. of Melbourne 4½ p.c. Deb.	99—101	88—93*	...
529,705	,,	Dec. 30	3½	3⅛%	Monte Video, Ltd.	11½—12	60—70	63—65
15,000	10	Mar. 11	—	8%	Newcastle & Gatsh'dCon.	98½—99½	55—57	...
55,940	10	,,	7/14/0	5⅝%	Do. 3½ p.c. Deb.	82—83	50—51	...
300,000	Stk.	Nov. 26	8	8%	North Middlesex 10 p.c.	...	12½—13	...
60,000	5	Mar. 26	10	1/-	,, ,, 7 p.c.	14—15	7—7½	...
60,000	50	Feb. 25	13	7½%	Oriental, Ltd.	117—122	90—100	...
100,000	50	,,	12	6½%	Ottoman, Ltd.	7½—7⅝	2—3	...
249,980	5	April 29	8	—	Portsea Island, B	128—131	65—70	...
499,960	5	June 26	5	—	Do. C	118—121	50—55	...
521,600	100	Dec. 1	4	4%	Primitiva Ord.	5½—6	⅛—⅛	9/6
600,000	Stk.	Jan. 27	4	4%	Do. 5 p.c. Pref.	4½—5	1⅛—1⅞	25/—27/1½
346,198	,,	Dec. 30	4	4%	Do. 4 p.c. Deb.	91—93	67—69	67⅜—68½
150,000	10	Mar. 30	6	6/-	Do. ,, ,, 1911	...	37—40	...
125,000	50	Jan. 3	5	5%	River Plate 4 p.c. Deb.	85—87	37—40	...
135,000	Stk.	Mar. 30	10	5%	San Paulo — 6 p.c. Pref.	10½—11	6—7*	...
209,984	,,	,,	10	4½%	San Paulo — 5 p.c. Deb.	47—49	37—39	...
523,500	,,	,,	10	3⅛%	Sheffield A	223—224	64—67*	...
133,201	Stk.	Sept. 15	4	4%	Do. B	222—224	64—67*	...
90,000	10	Sept. 30	9	9%	Do. C	220—222	62—64*	...
6,609,895	Stk.	Feb. 10	5/4/0	5%	Shrewsbury 5 p.c.	...	...	...
250,000	,,	Jan. 13	—	5%	South African	10½—11½	10½—11⅛	...
1,895,445	,,	,,	3	3%	South Met. Ord.	111—113	62—65	62—63½
224,820	,,	Feb. 25	8½	7½%	Do. Red. Pref.	...	90—92	...
1,087,795	,,	,,	6	3⅛%	Do. 3 p.c. Deb.	72½—74½	45—48	46½
247,558	,,	Dec. 30	5	5%	South Shields Con. Stk.	157—159	86—88	...
647,740	,,	Nov. 12	7½	3⅛%	S'th Suburb'n Ord. 5 p.c.	114—116	56—61	...
121,275	,,	Dec. 30	4	4%	Do. 5 p.c. Deb. Stk.	116—118	65—70	...
120,000	,,	Feb. 25	—	3⅛%	Southampton Ord.	99—102	55—58	56—56½
782,275	,,	,,	6	2½%	Do. 4 p.c. Deb. Stk.	...	57—59	...
181,255	,,	Dec. 15	4	4%	Tottenham District — A 5 p.c.	135—138	57—62	...
182,380	10	Dec. 30	5	—	Tottenham District — B 3½ p.c.	115—117	50—55	52
149,900	10	July 1	5	5%	Tottenham District — 4 p.c. Deb.	87—89	55—58	...
236,476	Stk.	Feb. 25	5	3⅛%	Tuscan, Ltd.	5—6	1—2	...
					Do. 5 p.c. Deb. Red.	93—95	45—50	...
					Tynemouth 5 p.c. max.	108½—109	68—70	...
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	Feb. 25	8½	47/6	Wandsworth A 5 p.c.	151—156	75—80	...
255,636	,,	,,	6½	32/6	Do. B 3½ p.c.	129—134	53—58	...
108,075	,,	,,	—	33/3	Do. C	...	50—55	...
140,865	,,	,,	—	33/3	New Ordinary	...	50—55	...
352,000	,,	,,	6½	26/3	Wimbledon 5 p.c.	117—122	43—48	...
98,000	,,	,,	6½	32/6	Epsom 5 p.c.	121—126	50—55	...
88,416	,,	Dec. 30	3	3%	3 p.c. Deb. Stk.	66—69	40—45	...

* Ex Div.

Revenue from Pitch at Bradford.—The Bradford Gas Committee have been informed by the Engineer (Mr. Charles Wood) that the final payment on account of the sale of the pitch from the tar produced at the works during the war having been made, the position now is that by suspending sales of pitch (contrary to the practice followed throughout the country generally) the department had made a profit of at least £27,670 in excess of the sum which would have accrued if the pitch had been sold at the highest ruling market prices during the period of the suspension of sales.

Robbing a Gas Company.—At the Mansfield (Notts) Police Court last Friday, William James Jeffs, an engineer of Selston, was summoned for getting gas for nothing from the Riddings District Gas Company. It was said that defendant had a slot meter, but owing to the advance in the price of gas he told the Company to take away the meter. This they did; but later information was received that a light had been seen in the house. An inspection was then made, and it was found that defendant had connected the service pipe with 4 ft. of rubber piping and was thus getting gas for nothing. Defendant said he only used the gas at nights. An official of the Company said the meter was taken away from defendant's house on March 1. Defendant, who did not appear, was fined £5.

The marriage recently took place of Mr. Fred Firth, the Chemist in the Leeds Corporation Gas Department, and Miss Nellie Blackburn, a daughter of a member of the Leeds City Council. The presents included a canteen of cutlery from Mr. Firth's colleagues in the Gas Department.

The engagement is announced of Mr. J. Mitchell, the Gas Engineer at Nelson (Lancs.), and Miss Jessie Morton Fyffe, a daughter of Mrs. Fyffe, of Cheadle Hulme, sister of the late Mr. A. Morton Fyffe, who held the office now occupied by Mr. Mitchell and afterwards took up a similar position at Blackburn.

The Stirling Gaslight Company are to allow a rebate of 10d. per 1000 c.ft. from the present price of gas to domestic consumers. The rebate will be paid from the balance still in hand. The Company's total rebate to domestic consumers is 1s. 4d. per 1000 c.ft. An allowance of 6d. was given the previous quarter.

The Newtownards Urban Council have decided to place a contract for new carbonizing plant in connection with the gas-works extension and improvement with Messrs. Perry & Co. (Bow), Ltd., of London; this comprising a 250,000 c.ft. per day complete gasification plant on the latest principles, including accessory plant. The inclusive cost is to be £13,017.

An exhibition is announced to take place this season with the object of illustrating the progress made in developing co-partnership and profit-sharing schemes, also other means of promoting industrial peace, harmony, and progress. The exhibition, which will be called the Co-Partnership Exhibition, will be held at the Crystal Palace, opening on Sept. 1 and continuing until Oct. 22. It is anticipated that the congress and various conferences to be held in connection with the exhibition will result in lasting benefit to British industry, and further popularize a movement which has proved its value in some of the best-known and largest business undertakings in the land.

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ADVERTISEMENT NO. 7024.

APPLICANTS for the Position under the above number are THANKED and Informed that AN APPOINTMENT HAS NOW BEEN MADE.

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APPLICANTS for the Position of WORKS MANAGER to the above Company are Hereby THANKED and Informed that THE VACANCY HAS BEEN FILLED.

THE Gas Light and Coke Company have a Vacancy for a JUNIOR GAS ENGINEER. Candidates must not be more than 25 Years of Age, and must be Thoroughly Experienced in Modern Carbonizing Methods.

Applications, stating Age, Qualifications, Present Occupation, and Previous Experience, with *copies* of Three recent Testimonials, should be addressed to the Secretary of the Company, Horseferry Road, Westminster, S.W. 1.

GOSPORT GAS AND COKE COMPANY.

APPOINTMENT OF SECRETARY.

THE Directors are prepared to receive Applications for the Position of SECRETARY, at a Commencing Salary of £325 per Annum, rising by annual increments of £25 to a maximum of £400, after Approved Service.

Applications, stating Qualifications, Experience, and Age, but without Testimonials in the first instance, to be addressed to the Chairman of the Company, Gas Offices, High Street, Gosport, and to be received not later than April 18, 1921.

E. Allison,
Secretary, *pro tem.*

Gas Offices, High Street,
Gosport.

COUNTY BOROUGH OF BOLTON.
(Gas Department.)

WORKS MANAGER.

APPLICATIONS are invited for the above Position at the Gas Street Gas-Works. Salary, £200 per Annum, *plus* Bonus under the Civil Service Scale, which at present is £233 7s. 7d. per Annum; making a total of £433 7s. 7d. per Annum.

Applications, endorsed "Works Manager," stating Age and full Particulars as to Experience, Qualifications, &c., with *Copies* of not more than Three Testimonials of recent date (which will not be returned), to be addressed to the Chairman of the Gas Committee and Delivered to the undersigned not later than Tuesday, the 19th of April, 1921.

Canvassing directly or indirectly will be held to be a disqualification.

Samuel Parker,
Town Clerk.

Town Hall,
Bolton,
April 6, 1921.

BRIDGEND GAS AND WATER COMPANY.

APPLICATIONS are invited for the Position of MANAGER of the Works of the above Company at a Salary of £300 per Annum.

Candidates must have a Thorough Practical Knowledge of Coal and Water Gas Manufacture and Distribution, also of Pumping Machinery and Water Supply.

Applications, stating Age, Experience, and Present Position, and accompanied by *copies* of not more than Three recent Testimonials, to be endorsed "Manager" and addressed to the Secretary, Gas Offices, Bridgend, Glamorgan, not later than the 16th inst.

J. H. Dyer,
Secretary.

Bridgend, April 5, 1921.

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State Ground Covered and Qualifications, to C.M. Manager, Stimex Gas Stove Co., Ltd, Stimex House, Balham, London, S.W. 12.

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LIST of Modern Gas Plant just issued. Copy willingly sent on application.

This comprises Retort Mountings, Condensers, Washers, Scrubbers, Purifiers, Gasholders, Exhausters, and Sundries. Complete Installations, Renewals, and Extensions.

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Manager, Gas-Works, Sandown, Isle of Wight.

FOR SALE—Vertical Boiler 11 ft. by 4 ft. diameter, Four Cross Tubes, Insured for 80 lbs. Working Pressure, Complete with Mountings except Main Steam Valve.

Offers to be sent to the Manager, Gas-Works, Sidmouth.

FOR SALE—One New Lancashire BOILER, 30 ft. by 8 ft. by 160 lbs. Working Pressure.

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Write, giving full Particulars, to No. 7034, care of Mr. King, 11, Bolt Court, Fleet Street, E.C. 4.

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Particulars to W. T. Bark, Manager, Gas-Works, Tenterden, Kent.

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Further Particulars from the undersigned.

F. Bowen, M.Sc.,
Engineer and Manager.

Gas-Works,
Leigh, Lancs.

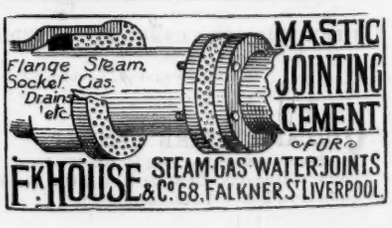
OFFERS wanted for surplus Ammonia- CAL LIQUOR, Crude or Concentrated 15 p.ct., in Buyers' Tanks at Blackpool Gas-Works.

William Chew,
Engineer and Manager.

SILSDEN URBAN DISTRICT COUNCIL.
(Gas Department.)

THE above Council invite Tenders for the Supply of SILICA and FIRE-CLAY GOODS. Specification and Form of Tender may be had on Application to the undersigned.

Tenders to be lodged at the Gas Office, Silsden, not later than April 16, 1921.

M. Driver.

Gas-Works,
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